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TeleCare / Télésoins: Evaluation of New Brunswick's 1-800 Dial-a-Nurse Service (Region 1 Pilot)

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Executive Summary

1.0 Introduction

Non-urgent conditions typically comprise between 65 to 70% of all visits to Emergency Departments, but there is some question whether all of these visits truly belong there. Some of these non-urgent visits appear to be "discretionary" (e.g. flu symptoms, minor abrasions), and could perhaps be effectively reduced or deferred in order to improve the efficient use of the ED for more urgent conditions. Yet, efforts to reduce "unnecessary" non-urgent visits by charging user fees, or by establishing walk-in clinics, have not generally succeeded[1]. This has led to consideration of other possible options, such as telephone triage. Alternative models of care involving telephone triage have proven successful in other jurisdictions, notably in the United States, where they have apparently reduced non-urgent Emergency Department (ED) visits[2].

In order to test the feasibility of this telephone triage concept, a TeleCare/TéléSoins[3] pilot project was established in early January 1995. Located in Moncton, TeleCare began as a 2 year pilot project between Hospital Corporations in Region 1-- South-East and Beauséjour. This evaluation report focuses on this initial 2 year phase of the TeleCare pilot project, in Health Region 1, based on a framework provided by the submission to Policy and Priorities Committee. As outlined below under "Findings", the evaluation therefore aims to assess TeleCare's performance with respect to the following goal and set of six (6) operational objectives:

Goal

To provide an appropriate and cost-effective delivery of health care to those residents of Health Region 1 who require specific symptom-related information for non-urgent conditions.

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1 As part of an overall health reform package introduced by Saskatchewan in 1968, a $2 per visit user fee at emergency departments and outpatient clinics failed to reduce overall hospital utilization, despite a drop in utilization by the poor and elderly. (R.G. Beck and J.M. Horne, "Study of User Charges in Saskatchewan 1968-71", in User Charges for Health Services: A Report of the Ontario Council of Health, quoted by M. Rachlis and C. Kushner in Strong Medicine, (Harper-Collins, 1994) p.155-157). An American study (Selby, 1996) showed that those HMO patients who were required to make copayments of $25 or $35 for each ED visit did make 15% fewer visits than the control group, but some of them had diagnoses that were classified as "often an emergency" (e.g. head trauma, sickle cell crisis, pregnancy complications).

2 Regarding the effectiveness of telephone triage, it should be noted that many American HMOs levy a copay on unapproved ED use by their clients, so it is difficult to generalize American triage effectiveness to the Canadian context. Furthermore, a 1989 Scandanavian study suggested that "while triage decreased subsequent ED use for some non-urgent attendees, frequent ED attendees did not appear to be influenced by the intervention" (Hansagi et al, quoted by Lewis et al, Saskatchewan HSURC, p.6).

3 TeleCare/TéléSoins is a tradename for the New Brunswick based telephone triage service.

Main Objectives

1. To increase public awareness of this service over the course of the pilot study.

2. To increase public acceptance (utilization) of the service over the course of the pilot study.

3. To reduce utilization of the Region's Emergency Department services for non-urgent conditions.

4. To assess user's satisfaction with the service.

5. To monitor the number of visits to physician's offices in Region 1 over the course of the pilot project.

6. To assess the cost-effectiveness of the telephone triage mode of service delivery.

2.0 Data Sources

Information for use in the evaluation came from several main sources. Regular downloads of raw data from the TeleCare database[4] provided basic descriptive information about utilization patterns, and provided the basis for drawing random samples of clients for several satisfaction surveys which were conducted by phone during the course of the pilot. Detailed case information from local emergency departments was also obtained, in order to conduct statistical analyses and to perform periodic case reviews of TeleCare dispositions as part of the regular quality assurance process. Although required data were generally available for most analyses, there were some data limitations. Whereas "non-urgent" visits to ED were available for most hospitals based on exact coding of detailed conditions[5], this level of detail was not available for all years at certain hospital sites (see main text for details).

3.0 Overview of Statistical Methods

To measure the success of TeleCare in achieving the identified service objectives, descriptive statistics such as frequencies and means have been used to profile the results of client satisfaction surveys and other utilization data. Inferential statistics have been used to test for associations and

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[4] National Enhancement DOS-based Centramax software was used for most of the 2 year pilot, except for the last several weeks when a windows-based version was introduced.

[5] This equated with acuity categories 1 (minimal) and 2 (moderate), according to the workload measurement systems in place at the George Dumont (NHPIP) and Moncton City EDs. This excluded higher acuity conditions for categories 3 through 5 (Complex, Extensive, Critical).

correlations between variables of interest. For instance, multi-variate regression methods have been used to test for significant relationships between TeleCare call volumes and non-urgent emergency department visits (NUED). These regressions have also incorporated dummy variables to control for seasonality and other confounding qualitative factors. For these analyses, statistical significance has been based on a 95% confidence level ($\alpha = 0.05$). In addition to the regression analyses, inter-rater agreement regarding the clinical appropriateness of TeleCare dispositions has been tested using a weighted Cronbach alpha statistic.

4.0 Findings, by objective

1. Public awareness of the TeleCare service has increased during the pilot study. Based on a telephone survey of non-urgent visitors to major Emergency Departments in Region 1, **over 60% of ED respondents surveyed were aware of TeleCare as of October 1996**.

2. Public acceptance and utilization of the new service has grown over the course of the study. There have been over 73,000 calls to TeleCare over the 2 years since January 1995. This equates with about 32,000 new unique callers, or about **1 in every 5 residents (i.e. 18%)**. In rural areas, it appears that French-speaking callers in the North of Region 1 are among the highest users; in the Moncton area, English-speaking users tend to predominate.

3. Regression analysis of non-urgent visits by presenting problem has revealed that TeleCare is associated with **fewer** NUED visits related to cold and flu symptoms, abrasions/contusions/scratches, back and neck pain (no injury), otitis media, and post-op complications. On the other hand, it is associated with **more** visits for unspecified chest and abdominal conditions, gastro-enteritis, suture removal and sprains / strains. These results would seem to indicate that TeleCare has had some impact on reducing deferrable ED visits, while also increasing utilization for unspecified chest pain and other conditions which may be appropriately served in the ED setting. **Overall though, TeleCare is not associated with any general decrease in Non-Urgent ED visits, and appears to be associated with slightly higher NUED**. It should be noted however, that this finding tends to obscure the real positive impact that TeleCare has apparently had on **improving patient triage**.

4. It appears that TeleCare callers are generally very satisfied with the new service, compared to conventional service provided to Non-Urgent patients by local Emergency Departments. Based on a satisfaction survey of the TeleCare service conducted in March 1996, **about 89% of callers were "very satisfied"**, with an additional 4% who were "somewhat satisfied". About 44% of respondents found that the quality of the TeleCare service was "better than expected", with an additional 50% who found that it was "as expected". 97% of respondents said they were able to follow TeleCare's instructions, only 2% were unable to do so.

5. According to Medicare, there have been 12 new GPs added to Region 1 since January 1994. Due to retirements and aging however, their overall number and productivity in terms of billings (e.g. Full-Time Equivalents) has remained virtually unchanged. The need for face-

to-face primary care provided as part of regular scheduled GP office visits (e.g. physical exams, etc.) is not expected to change due to TeleCare. Rather, TeleCare is expected to affect mainly the number of unscheduled visits made after hours to GP offices / Walk-In Clinics for "deferrable" non-urgent conditions. Visits to GP offices after hours in rural areas also expected to remain largely unaffected, with most patients being directed to the local EDs after hours. To examine the impact of TeleCare on after hours clinics and GP office visits, regression analysis was used to test for significant changes in underlying trends. Based on these two analyses, which also accounted for seasonal variation and underlying trends, there was no statistically significant association observed in either case. **Therefore, TeleCare does not appear to be associated with higher or lower volumes of Walk-In Clinic visits, or GP office visits**[6].

6. **a) TeleCare has not decreased the cost of health care to the province. It is an "add-on" to the provincial health care budget.** The total increase in Direct Cost due to TeleCare is estimated as the difference between the **$1,330,769** operating cost over the 2 year pilot, and any potential cost savings due to referrals to less costly sources of care. In the "best case" scenario, where telephone triage has apparently had a significant impact of service referrals as per Table 6, this amounts to savings of about **($713,000).** In the "worst case" scenario, where TeleCare has apparently added 9000 extra NUED with no other significant change in health care utilization, this amounts to additional cost of about **$288,000.** Depending on which scenario is chosen, this amounts to an overall net incremental cost of either **$618,000** or **$1,619,000** for the entire 2 year pilot. In both cases, it has increased the cost of health care to the Department.

b) TeleCare is potentially cost-effective and offers good value-for-money compared to other "status quo" options for treating deferrable non-urgent symptoms. (The increased levels of satisfaction reported by TeleCare callers compared to that for Emergency Department visitors also serves to reinforce this conclusion). Cost-effectiveness refers to the cost per unit of effect. Often, effectiveness units refer to measurable health outcomes in terms of life years gained or increased functionality (e.g. range of movement) for specific treatment options. In this case, where the range of non-urgent conditions is non-specific, and largely non-life-threatening, a global measure of effectiveness will be used -- the number of triaged calls (excluding information only calls). The costing perspective in this case is that of the Department of Health and Community Services. Therefore, for each scenario, the cost-effectiveness ratio is:

"Best case scenario":
$618,000 net incremental cost divided by **64,000** triage calls = **$9.66 per triage call**

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[6] **Addendum: Subsequent cohort analyses have found a positive association, reversing this initial conclusion.**

"Worst case scenario":
$1,619,000 net incremental cost divided by **64,000** triage calls = **$25.29 per triage call**

In the "best case" scenario, the marginal cost per non-urgent contact with TeleCare is less than either the marginal cost of a Walk-In Clinic visit ($20 per GP office visit), or a Non-Urgent Emergency Department visit ($32 per visit). In the "worst case" scenario, it is still less costly than NUED, but more costly than a GP/Walk-In Clinic visit. It should be noted though, that TeleCare has certain other additional benefits which are not explicitly reflected in these cost-effectiveness ratios (see section 5.65). For this reason, and because the marginal cost of operating TeleCare is apt to decrease when the service expands (i.e. due to economies of scale), we conclude that TeleCare is potentially cost-effective[7].

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7 **Addendum: subsequently, in January 1999, the TeleCare budget under contract to Clinidata was raised to $2.6 million per year, for 3 years, with a maximum annual call volume of 145,000. This included provisions to handle any new call volumes related to "rabies information". Any calls beyond the maximum ceiling were to be charged at $13.75 per extra call.**

5.0 Recommendations

1. Since American-based clinical protocols in TeleCare's "Centramax" software may not necessarily coincide with current Canadian standard practice, case reviews of various specific conditions should be explored to see whether existing clinical guidelines in "Centramax" can be improved. (The Department does not currently have a copy of the guidelines being implemented by TeleCare on its behalf by Clinidata, apparently due to copyright restrictions).

2. The evaluation revealed that multiple ids were recorded for about 7% of TeleCare callers, based on those who had been double-registered. This creates a problem of data quality, which should be addressed through a regular monthly "merge and purge" of the registry dataset. This will avoid any duplication of case ids.

3. The Centramax database records information by caller and call, but there is no data entity to link related episodes of care. For instance, a person can call twice in the same day about the same complaint. It would be useful to create a new data field to identify whether the caller is calling about a "new case / episode" or is merely getting follow-up from an earlier call.

4. About 6% of TeleCare callers identified for case review could not be identified using the Medicare dataset for Region 1. Since TeleCare is a front-end data collection system which will record updated information by place of residence on an ongoing basis, their data registry will become more accurate and relevant than the official Medicare registry database (which requires only that people update personal information when they renew their card every 5 years). This TeleCare information regarding current place of residence should be downloaded to the Department at regular intervals, for use in various Epidemiological and planning studies as a flexible population denominator (i.e. alternative to Statistics Canada inter-censal estimates).

5. Since callers' compliance with the TeleCare referral is an important aspect regarding the effectiveness of the service, it is recommended that further study may be warranted to explore the extent of non-compliance, and the reasons for it.

6. As callers become more knowledgeable and feel more secure with the TeleCare service, it is likely that the scope for self-care at home by the client will expand. This should be monitored over time, and included as a part of the next phase of the TeleCare evaluation.

7. Given the positive nature of the response, this model could be considered for expansion to other areas.

1.0 BACKGROUND / RATIONALE

Non-urgent conditions typically comprise between 65 to 70% of all visits to Emergency Departments, but there is some question whether all of these visits truly belong there. Some of these non-urgent visits appear to be "discretionary" (e.g. flu symptoms, minor abrasions), and could perhaps be effectively reduced or deferred in order to improve the efficient use of the ED for more urgent conditions. Yet, efforts to reduce "unnecessary" non-urgent visits by charging user fees, or by establishing walk-in clinics, have not generally succeeded[1]. This has led to consideration of other possible options, such as telephone triage. Alternative models of care involving telephone triage have proven successful in other jurisdictions, notably in the United States, where they have reduced non-urgent Emergency Department (ED) visits by as much as 15%[2]. Were this to occur in New Brunswick, it has been estimated that a 15% reduction in ED use would equate with savings of $3 to $4 million per year on a province-wide basis.

These ideas have provided the impetus for the New Brunswick-based telephone triage service known as TeleCare/TéléSoins, which was initially conceived as a telephone-based Cold and Flu Clinic[3]. Since most cough/cold/flu sufferers do not require either medical intervention or prescription drugs, it was suggested that an effective means of providing service to this target group would involve completing a telephone assessment and providing advice / reassurance as indicated. If the assessment were to indicate the need for diagnostic or therapeutic intervention, then the patient would be referred to the Emergency Department or their family physician. Later, it was realized that the number of potential cough/cold/flu patients who might use the new service was only a fraction of the total number of non-urgent visits to Emergency Departments. Therefore, the range of conditions to be addressed under TeleCare was expanded to include other non-urgent conditions, in order to provide sufficient scope and scale for an efficient-sized telephone triage service. The choice of possible service referrals was also expanded in light of the broader list of possible non-urgent conditions, and computer-based decision-support software was added in order to improve the consistency of the clinical advice.

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1 As part of an overall health reform package introduced by Saskatchewan in 1968, a $2 per visit user fee at emergency departments and outpatient clinics failed to reduce overall hospital utilization, despite a drop in utilization by the poor and elderly. (R.G. Beck and J.M. Horne, "Study of User Charges in Saskatchewan 1968-71", in User Charges for Health Services: A Report of the Ontario Council of Health, quoted by M. Rachlis and C. Kushner in Strong Medicine, (Harper-Collins, 1994) p.155-157).

2 A 1996 study by Selby showed that those HMO patients who were required to make copayments of $25 or $35 for each ED visit made 15% fewer visits than the control group, but some of these had diagnoses that were classified as "often an emergency" (e.g. head trauma, sickle cell crisis, pregnancy complications). In terms of the effectiveness of triage as an alternative, a 1989 Scandanavian study suggested that "while triage decreased subsequent ED use for some non-urgent attendees, frequent ED attendees did not appear to be influenced by the intervention" (Hansagi et al, quoted by Lewis et al, Saskatchewan HSURC, p.6).

3 Details were proposed in a submission to the Policy and Priorities Committee of New Brunswick.

1.1 Goals and Objectives

In order to test the feasibility of this telephone triage concept, a TeleCare/TéléSoins[4] pilot project was established in early January 1995. Located in Moncton, TeleCare began as a 2 year pilot project between Hospital Corporations in Region 1-- South-East and Beauséjour. This Region was chosen for the pilot because of its particular demographic characteristics (mixed francophone/anglophone population, and rural/urban mix). During that time, the operational features of TeleCare have evolved to include Poison Control information as well as other significant service delivery enhancements, such as the use of "call-backs".

This evaluation report focuses on this initial 2 year phase of the TeleCare pilot project, in Health Region 1. Based on a framework provided by the submission to Policy and Priorities Committee, the evaluation therefore aims to assess TeleCare's performance with respect to the following set of specific goals and objectives:

Goal

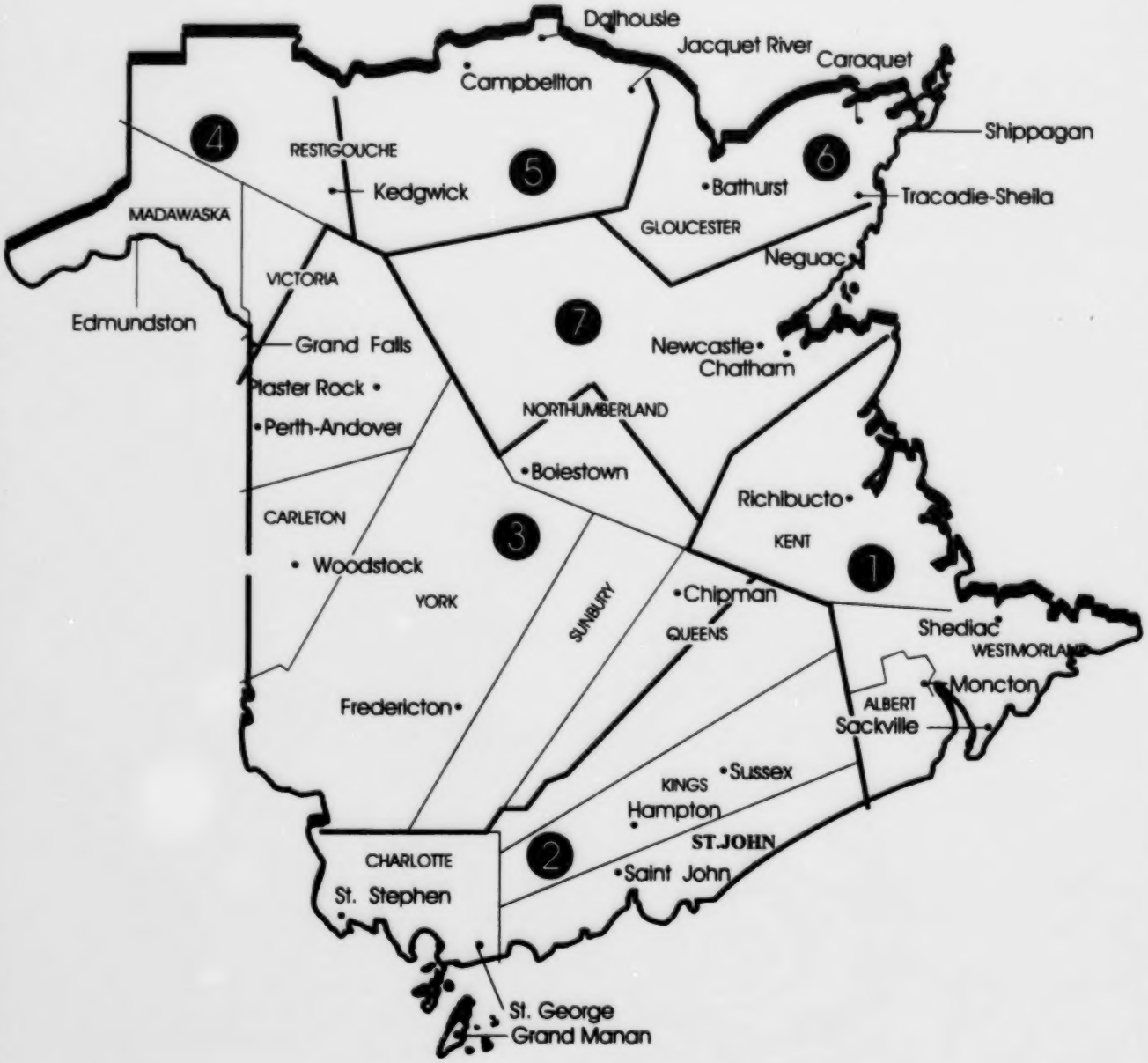
To provide an appropriate and cost-effective delivery of health care to residents of Health Region 1 who require specific symptom-related information for non-urgent conditions.

Main Objectives

1. To increase public awareness of this service over the course of the pilot study.
2. To increase public acceptance (utilization) of the service over the course of the pilot study.
3. To reduce utilization of the Region's Emergency Department services for non-urgent conditions.
4. To assess user's satisfaction with the service.
5. To monitor the number of visits to physician's offices in Region 1 over the course of the pilot project.
6. To assess the cost-effectiveness of the telephone triage mode of service delivery.

[4] TeleCare/TéléSoins is a tradename for the New Brunswick based service, and not a generic term for telephone triage.

Health Regions



1.2 What is TeleCare / TéléSoins?

TeleCare/TéléSoins is defined as a bilingual telephone triage service whose main goal is to provide an alternative source of care to patients with deferrable non-urgent conditions[5] (see brochure opposite). By giving timely toll-free advice to patients regarding their various symptoms, TeleCare's experienced emergency nurses provide reassurance, specific instructions, or referrals to the emergency department, family physicians, or other appropriate services (e.g. pharmacy)[6]. In so doing, TeleCare aims to reduce the volume of avoidable non-urgent visits to emergency departments, while also providing improved access to timely advice for non-urgent conditions[7].

TeleCare has been promoted using a variety of different publicity events and media strategies. In February 1995, letters of invitation and stickers with the toll-free number were mailed out to all households in the Region[8]. This was accompanied with major media releases by the Department and appearances on radio and TV by the TeleCare coordinator. Various other poster campaigns and promotional initiatives aimed at church groups, university students, and other members of the public

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5 A deferrable non-urgent condition is defined as any illness or injury which does not require the resources of an Emergency Department; which may or may not require routine medical / nursing intervention; and for which a delay in treatment of 24 hours would not make an appreciable difference in the patient's clinical outcome. Examples of deferrable non-urgent diagnoses include certain viral illnesses and chronic pain.

6 Symptom-related information is assessed by a nurse with reference to clinical protocols contained in the Centramax triage software. Based on this information, the nurse will direct the caller to proceed in one of four ways:

1) Go directly to the Emergency Department of patient's choice;
2) Contact their family doctor, the doctor taking his/her calls or the local walk-in clinic to arrange an appointment;
3) Follow specific instructions and, if indicated, recontact TeleCare after a specified period of time for a follow-up. Instructions may be as simple as "no" action is required;
4) Make a regular appointment with their family doctor to address the problem.

7 Whereas telephone nursing may encompass a number of activities ranging from chronic disease management, public health interventions, or other phone-based nursing, TeleCare's specific mandate is more narrowly-defined. A critical review of the effectiveness and efficiency of various types of telephone nursing support is provided in a research paper by Roberts et al. More generally, a new electronic magazine devoted to the new specialty of telephone nursing has also recently emerged on the Internet, and serves to describe some of recent trends in the United States (URL is http://ally.ios.com/~webster/index.html). Another example of integrated telephone nursing services is provided by Québec, called Info Santé, where telephone nursing and primary care have been successfully integrated into their regional community health centres (CLSCs). An evaluation of Info Santé is available, as indicated in the bibliography.

8 On February 28, 1995, promotional TeleCare cards were mailed to Moncton residents (N=23,740), then on March 2 to residents of Riverview and Dieppe (N=15,424). Finally on March 7, cards were mailed to other rural residents in Region 1 (N=26,470).

Vous pensez vous rendre au service d'urgence de votre hôpital?

S'il s'agit d'un cas d'urgence, présentez-vous au service d'urgence. Si vous n'en êtes pas certain, appelez Télé-Soins.

Des infirmières d'urgence expérimentées répondront à votre appel. Une fois vos symptômes évalués, l'infirmière de Télé-Soins vous donnera les renseignements qui vous aideront à prendre une décision. On pourrait vous conseiller :

- de suivre les instructions de l'infirmière;
- de communiquer avec votre médecin de famille ou le médecin en appel;
- de vous rendre au service d'urgence le plus près.

Appelez Télé-Soins **1-800-244-8353**

Télé-Soins est un service bilingue offert par le ministère de la Santé et des Services communautaires.

Renseignements 24 heures par jour
Sept jours semaine

Pour faciliter votre prise de décision en ce qui concerne vos soins de santé.

Thinking about going to your hospital's Emergency Department?

If it is an emergency, go to the Emergency Department.
If you are not sure, call Tele-Care.

Your call will be answered by experienced emergency nurses. After assessing your symptoms, a Tele-Care nurse will provide information to help you decide what to do.

This advice may include:

- following the nurse's instructions
- contacting your family doctor or the doctor on call
- going to the nearest Emergency Department

Call Tele-Care **1-800-244-8353**

Tele-Care is a bilingual service provided by the Department of Health and Community Services.

24 hour information
7 days a week

Helping you make appropriate health care decisions

have also been conducted, on an ongoing basis.

On April 30, 1996, TeleMedicine Canada featured a special session devoted to the TeleCare service, and included listeners from across Canada and the United States. This served to foster awareness of the service among clinical groups and other interested parties.

1.3 History of TeleCare (Phase I)

Feb. 1994	Speech from the Throne identifies that new opportunities for role enhancement of service providers should be sought in other settings, such as cold and flu clinics
June 1994	Policy and Priorities Committee approves the establishment of a telephone triage program on a pilot basis, for a two year period, in Health Region 1
Jan. 1995	TeleCare begins operation
28 Feb. 95	Promotional coupon mail-out to Region 1 residents
Aug. 1995	Premier McKenna announces that TeleCare will be expanded to all parts of the province as part of the government's health platform
Nov. 1995	"Dr. Direct" service begins operation, offering on-the-spot medical advice from a doctor on a 24 hour basis. This new service is like TeleCare in appearance, but it is not covered under Medicare, and is paid for as part of the client's telephone bill ($3.99 plus tax / minute)
Jan. 1996	Poison Control services are added to TeleCare as another service component
Nov. 1996	Dial-a-Doc service ("Dr. Direct") stops operating due to insufficient client demand (CBC Radio Noon - 27 Nov 1996); call volume was apparently about 150 calls per month
19 Nov 96	Callback system monitoring test shows large reduction in abandoned calls
19 Dec 96	Centramax Windows'95 software is implemented by TeleCare, with extended capabilities and faster data capture
5 Jan 97	end of Phase I pilot project in Region 1

Note: In August 1995, the Premier announced that TeleCare would be expanded province-wide, although this did not actually take place until after the Region 1 pilot had completed its full 2 year term.

2.0 DATA SOURCES FOR THE STUDY

Information for use in the evaluation came from several main sources. Regular downloads of raw data from the TeleCare database[9] were provided to the evaluators in fixed ASCII format, for subsequent analysis using SPSS statistical software. This provided basic descriptive data about utilization patterns. This TeleCare data also provided the basis for drawing random samples of clients for several satisfaction surveys conducted by phone during the course of the pilot. Information from local emergency departments was also obtained, in order to conduct statistical analyses and to perform periodic case reviews of TeleCare dispositions as part of the regular quality assurance process. Although data were generally available for most analyses, there were some data limitations. Whereas "non-urgent" visits to ED were available for most hospitals based on exact coding of detailed conditions[10], this level of detail was not available at the Sackville ED. There, non-urgent visits were based on a one-time survey conducted from 8 December 1994 to 13 January 1995, and estimated at 84% of the total number of observed ED visits at the site. Also, the historical data on non-urgent ED visits at Ste-Anne-de-Kent ED were also unavailable for years prior to 1994, although total ED visits were available from HS1 reports to Statistics Canada. Therefore, non-urgent visits were estimated there based on the 76% non-urgent rate prevailing in 1994. This is likely a conservative assumption, since over time, the increasing trend in outpatient activity has tended to reduce the share of non-urgent visits as a proportion of total ED visits. For the Georges Dumont ED, non-urgent visits were available from 1994 and later, as well as for a 9 month period in 1992 based on hospital administrative data. Therefore, annual figures for 1992 non-urgent visits were extrapolated based on the average of 103 NU visits per day observed from March to December 1992. For Georges Dumont in 1993, non-urgent visits were estimated from HS1 reports, and an interpolated rate of 74% non-urgent based on observed rates for 1992 (78%) and 1994 (69%).

3.0 OVERVIEW OF STATISTICAL METHODS

To measure the success of TeleCare in achieving the identified service objectives, both descriptive and inferential statistics have been applied in preparing this evaluation report. Descriptive statistics such as frequencies and means have been used to profile the results of client satisfaction surveys and other utilization data. Inferential statistics have been used to test for associations and correlations between variables of interest. For instance, multi-variate regression methods have been used to test for significant relationships between TeleCare call volumes and non-urgent emergency department visits (NUED). These regressions have also incorporated dummy variables to control for seasonality and other confounding qualitative factors. For these analyses, statistical significance has been based on a 95% confidence level ($\alpha = 0.05$). In addition to the regression analyses, inter-rater agreement

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9 National Enhancement DOS-based Centramax software was used for most of the 2 year pilot, except for the last several weeks when a windows-based version was introduced.

10 This equated with acuity categories 1 (minimal) and 2 (moderate), according to the workload measurement systems in place at the George Dumont (NHPIP) and Moncton City EDs. This excluded higher acuity conditions for categories 3 through 5 (Complex, Extensive, Critical).

regarding the clinical appropriateness of TeleCare dispositions has been tested using a weighted Cronbach alpha statistic.

4.0 PROFILE OF TELECARE USERS

4.1 The Typical Call

When someone phones TeleCare, their call is routed electronically between one of two sites, at either the Georges Dumont or the Moncton Hospital. This call-routing is based primarily on the caller's selection of "preferred language of service": Francophone calls are routed exclusively to the Georges Dumont site, while Anglophone calls are routed to the Moncton Hospital site as long as one of its 3 available call-slots is unoccupied[11]. When the Moncton Hospital site becomes busy, other Anglophone calls are directed to the Georges Dumont site.

When call volumes are low, calls are handled one at a time in sequence. When call volumes are high (e.g. evenings), the call is answered by a TeleCare triage nurse, and the caller is asked whether or not they can be called-back[12]. Those exceptional callers who cannot be called-back or who require immediate service are registered and provided service directly. The majority of callers are not served directly upon initial contact though, and receive a call-back within 10-15 minutes, at which time personal details are recorded and service is provided[13]. This call-back procedure has been shown to reduce the number of abandoned calls significantly, while maintaining callers' level of satisfaction with the service.

Although TeleCare was originally conceived as a 24 hour service, it has actually been operating from 7 am to 1 am for most of the 2 year pilot[14]. It has since reverted to 24 hour service following the change in day-to-day management of the service, from Region 1 to Clinidata. As indicated in **Figure 1**, most of the calls are recorded in the evening, between the hours of 5 p.m. and 10 p.m. The range of call dispositions as a result of TeleCare are shown in **Figure 2** for the entire 2 year pilot.

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11 The 2 sites were consolidated into one central location when Clinidata began operating in Region 1 on January 6, 1997.

12 This "triage call-back" system was implemented starting in March 1996 at the Moncton Hospital site, and then later in November 1996 at Georges Dumont. Prior to this, calls were answered in turn and provided immediate service while others waited their turn in the queue. The "first come first served" approach led to relatively high numbers of abandoned calls, and was rejected in favour of the call-back approach as a result.

13 According to a survey conducted at the Moncton Hospital site in March 1996, about 6% of callers could not be called-back and required immediate on-line service. For those calls which were not processed immediately, the average time for call-back was about 5 minutes, with about 90% of calls being returned within 15 minutes.

14 Until March 1995, an average of only 4 to 5 calls per night were being received between 1-7 a.m. So, in order to increase staff in the evenings, the midnight shift was cancelled, and midnight calls were routed instead to the Emergency Departments at the Georges Dumont and the Moncton Hospital according to the caller's language of choice.

Most of the calls received were pediatric in nature, with the most common complaints relating to children's flu symptoms. The top 20 symptoms are listed below in descending order, based on the number of times the relevant clinical guidelines were referred to in March/April 1996:

	Frequency		Frequency
1. Vomiting - Children	168	11. Sprain	81
2. Fever - Children	154	12. Colds - Children	78
3. Diarrhea - Children	153	13. Lower back pain	73
4. Cough - Children	148	14. Abdominal pain - Child	71
5. Diarrhea - Adult	147	15. Chicken pox - Child	71
6. Chest pain	145	16. Constipation - Child	65
7. Sudden Abdominal Pain	139	17. Head Trauma - Child	62
8. Headache	93	18. Sore throat	62
9. Vaginal bleeding	91	19. Sudden vomit	61
10. Cough - Adult	86	20. Earache - Child	60

4.2 The Typical Caller

Over 70% of TeleCare callers are female[15]. As indicated by **Figure 3,** the typical caller is a mother in her early thirties -- which reflects the pediatric nature of many of the calls received. About 41% of callers phone on their own behalf, whereas about 41% phone on behalf of a child, and another 13% on behalf of another adult (see **Appendix F** for more details).

It is interesting to compare socio-economic characteristics of TeleCare callers with those of the population at large in Health Region 1. In terms of **employment status**, TeleCare callers are similar to the census population at large. **Figure 4** shows that about 55% of TeleCare callers were employed full-time or part-time according to a survey in July 1995, compared to 55% of Region 1 residents aged 15+ who were employed according to the 1991 census. About 9% of TeleCare callers were unemployed in that survey, compared to 9% of those in the 1991 census population aged 15+.

In terms of **educational attainment**, TeleCare callers appear to be more highly educated than the general population. Only about 26% of TeleCare users had not completed high school, compared to 44% of Region 1 residents aged 15+ in the 1991 census. An additional 27% of TeleCare users had graduated high school, compared to only 13% of the census population aged 15+.

15 There are a significant number of children who are registered for service by parents inquiring on the child's behalf. These children are evenly distributed by gender, so that the percentage of female clients registered is reduced to about 65% overall -- less than for actual callers.

5.0 RESULTS BY OBJECTIVE

5.1 To increase public awareness of this service over the course of the pilot study

TeleCare has been promoted using a variety of different publicity events and media strategies (see section 1.2). These efforts have served to foster awareness of the service among clinical groups and the public at large.

To assess public awareness of this service, a question was added to registration forms at the major Emergency Departments to determine the percent of ED users who had heard of TeleCare before. From June 1995 to April 1996, awareness about TeleCare among ED users had increased, from 46% to 80% at the Moncton City Hospital, and from 42% to 52% at the Georges Dumont Hospital. (By October 1996, awareness at Georges Dumont had increased to 59%; this is still 20% less than at the Moncton Hospital -- for which more recent data is unavailable). Since ED users with deferrable non-urgent symptoms are an important target group for the TeleCare service, their level of awareness is critical.

The observed differences between hospitals is likely due to a number of factors, which could be explored further in the future. Particularly since the day-to-day management of TeleCare is no longer hospital-based, greater efforts may be needed to increase awareness among hospital staff and patients (e.g. direct ED promotion) about the appropriate use of TeleCare services.

How did people come to hear about TeleCare in the first place? According to a satisfaction survey conducted in July 1995, **Figure 5** shows that most people found out about TeleCare either from: being told about it at the emergency department (25%), receiving a card with the phone number in the mail (23%), or by family and friends (20%). Relatively few found out about it through newspapers (8%) or general ads and posters (4%). This emphasizes the relative effectiveness of direct promotion through the mail and emergency departments when attempting to increase awareness in the population at large.

Regarding the broader population at large, it is clear from the increasing number of calls to TeleCare over time that more people are becoming aware of the service. It therefore appears that public awareness of the service has indeed increased over the course of the pilot project.

5.2 To increase public acceptance (utilization) of the service over the course of the pilot study

To address this objective, utilization rates for new and repeat callers were tracked over time. As indicated in **Figure 6,** the number of Region 1 residents who have used the TeleCare service has been steadily increasing, with about 32,000 new callers recorded in the system (i.e. about 18% of the base population, or 1 in every 5 residents). The number of repeat callers has been steadily increasing as well, with 82% of callers in December 1996 having called previously. (The average length of call for that month was about 10 minutes, with about 17% of calls abandoned[16]).

Among ED users, survey results for April 1996 indicated that about 51% of Non-Urgent ED users at the Moncton City Hospital, and 32% of Non-Urgent ED users at the Georges Dumont hospital, had used TeleCare before.

Comparing utilization within various local communities as a percent of the base population gives an indication of penetration rates in various parts of Region 1. In turn, these can be compared against language composition of area residents from the 1991 census. **Table 1** shows call rates per thousand population by community based on the last four months in 1996. Penetration rates within the Region remain higher in some areas than others, perhaps reflecting the impact of different local promotional strategies. It appears that rural residents from the North of the Region (whose mother tongue is predominantly French) are among the highest users so far, while rural residents from the South of the Region (whose mother tongue is predominantly English) are among the lowest. This difference could have been due to underlying socio-economic differences or to a variety of other factors which would have to be explored further.

Otherwise, within the urban area of Greater Moncton, about 35% of the base population indicated "French only" as their mother tongue according to the 1991 census. This compares with only 27% of TeleCare callers from the Moncton area who chose to access the "French speaking" phone queue at the time of service. Due to the bilingual nature of callers however, together with the limited information about "language of preference" reflected in the call system, it is not possible to make any clear conclusions about penetration by language of caller within the Greater Moncton area. For instance, it is quite possible that bilingual Francophones may have simply learned to avoid waiting by selecting the "English speaking" line whenever the "French speaking" line was busy.

[16] Some of these callers did succeed in getting through to TeleCare on their second try. The rate of abandoned calls may therefore include some of these who re-dialed.

5.3 To reduce utilization of Emergency Department services for non-urgent conditions

TeleCare has produced selective impacts on non-urgent Emergency Department (NUED) utilization in Region 1, particularly for cold and flu symptoms. In other words, the telephone triage function appears to be working in the desired direction. This conclusion is based on a covariation analysis using data from the Moncton Hospital, which examined month-by-month variation in NUED by presenting symptom in relation to TeleCare monthly call volumes.

Regression techniques were used to eliminate the confounding effect of seasonal variation, so that underlying trends and relationships could be examined for specific symptoms (see **Appendix C** for details). For this purpose, monthly data were obtained from the Moncton Hospital for the period from April 1991 to July 1996, for over 200 NUED presenting symptoms. As a result, two groups of symptoms were identified as statistically significant (95% confidence level): those which were negatively associated with TeleCare call volumes; and those which were positively associated with TeleCare call volumes[17]. In the first case, the negative association suggests that an increase in the number of calls to TeleCare is associated with fewer NUED visits. This group includes the following specific presenting symptoms:

- colds and flu-related symptoms[18]
- abrasions/contusions/scratches
- back pain (no injury)
- neck pain (no injury)
- otitis media (i.e. inner ear infection)
- post-operative complications

In the second case, the positive association suggests that an increase in the number of calls to TeleCare is associated with more NUED visits. This group includes the following specific presenting symptoms, several of which require either diagnostic equipment or timely "hands-on" diagnosis:

- unspecified chest condition
- unspecified abdominal condition
- gastro-enteritis
- sprains / strains
- suture removal

Taken together, these results seem to indicate that TeleCare has tended to reduce deferrable NUED

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[17] Another large group of symptoms either showed no association with TeleCare activity, or did not meet the cut-off chosen for statistical significance.

[18] This particular condition actually consisted of a group of diverse presenting symptoms including: influenza, upper respiratory infection, bronchitis, fever NYD, sore throat, SOB or coughing, congestion or cough, strep throat, sore all over, and viral illness.

visits, while also increasing utilization for unspecified chest pain and other symptoms which may be appropriately served in the Emergency Department on a timely basis. While these results do not prove that TeleCare caused more effective utilization patterns, the directions of change and patterns of clinical utilization by symptom are consistent with the expected outcome of such a triage service[19].

Beyond this, the total net effect of the telephone triage is also required for the purpose of determining overall cost-effectiveness of the service. This requires an overall assessment of total NUED volumes at a macro level in order to try and identify changes in underlying trends.

Before the project actually began, it had been estimated that as many as 33,186 NUED visits per year could be totally serviced by TeleCare alone, based on 30% of 1991/92 non-urgent visits in Region 1[20]. Of these, 75% or 25,000 ED visits were expected to be eliminated entirely, although some might require a later follow-up to a family physician. This overall level of reduction has not been attained however, and may be explained by a number of different reasons.

First, the fraction of non-urgent ED visits that are indeed deferrable[21] may have actually been less than the 30% of total NUED initially assumed, or caller non-compliance with TeleCare referrals may have been underestimated. Secondly, the lack of after-hours clinics in certain rural areas within the Region may have left TeleCare nurses with no choice but to refer some of these "clinic" cases to ED based on the apparent need for timely access to services outside of regular physician office hours. Thirdly, the trend towards earlier discharges from hospital and more outpatient clinics may have added to the volume of NUED visits due to the need for unexpected follow-up services or information requests arising post-discharge. Finally, there may have been an increase in latent demand for NUED services which would not otherwise have been experienced without TeleCare. For instance, certain persons with undiagnosed symptoms like chest pain might not have otherwise gone to the emergency department without TeleCare's instructions to do so.

It appears that the number of non-urgent ED visits is decreasing since TeleCare began, but at a

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19 No comparable data by presenting symptom was available for other Region 1 hospitals, so these results may not necessarily apply equally to the entire pilot Region.

20 It is important to note that TeleCare was not expected to reduce the number of urgent or emergent ED visits, so it is inappropriate to consider either "total ED visits" or "the percent of ED visits that are non-urgent" as indicators of TeleCare's impact. In the latter case, the number of urgent / emergent ED visits has generally increased over time due to the increase in day surgery and outpatient activities, which has tended to increase its share of overall ED visits. Conversely, this has tended to decrease the percentage share that is non-urgent, despite the fact that absolute levels of non-urgent ED visits have actually increased slightly at certain hospitals (e.g. Georges Dumont).

21 For instance, certain non-urgent visits involving suturing and possible x-rays are most appropriately served in an Emergency Department setting, and should be attended to within 12 to 24 hours. They cannot be deferred to a clinic or physician office due to the nature of the symptoms or the need for specialized diagnostic equipment.

decreased rate. As indicated in **Table 2,** the number of non-urgent ED visits in 1994 for Region 1 stood at about 113,618 prior to start up. After TeleCare began operating in 1995, this number decreased to about 109,505 -- a decrease of about 4,100 non-urgent visits for 1995. Although a decrease in non-urgent ED visits did occur, it should be seen in light of the longer term negative trend which predated TeleCare. In particular, the rate of decrease at the Moncton Hospital for the two years preceding TeleCare was -9.3% compared to -8.0% afterwards -- a relative increase of +1.3 percentage points. At the other large Moncton hospital, Georges Dumont Hospital, non-urgent visits actually increased slightly from 1994 levels in absolute terms. For the entire Region, the annual average rate of decrease before TeleCare was implemented was -6.7%, compared to only -3.8% afterwards. This represents a relative increase of 2.9 percentage points overall. This information is also shown graphically in **Figure 7**.

As indicated in **Table 2,** the annual average rate of decrease pre-TeleCare (e.g. -6.7%) may be used to extrapolate per capita utilization rates for subsequent years when TeleCare has been active. The resulting projected rates for 1995 and 1996 are 589 and 549 NUED visits per thousand residents respectively. Applying these projected rates to the base population for those years produces estimates of projected NUED visits for each year, that is, 106701 visits for 1995 and 100202 visits for 1996. Compared to actual observed NUED visits with TeleCare, this represents a relative increase of about 9,000 NUED visits within the Region[22]. It is important to note however, that this finding is based on the apparent change in underlying NUED trends which coincided with the introduction of TeleCare. It is possible that the observed change might have been due, not to TeleCare itself, but to some other confounding factor such as physician practice patterns (e.g. decreased office hours).

To try and address this issue, the possible influence of GP office visits on NUED visits and TeleCare call volumes was explored by conducting another regression analysis (see **Appendix D** for details). As indicated by the significant positive association observed between monthly NUED and TeleCare monthly call volumes, TeleCare activity appears to have been associated with more NUED visits not less. As indicated in **Appendix D**, the resulting equation explains about 96% of the observed variation in NUED visits, and is statistically significant overall (99% Confidence level). The positive coefficient on TeleCare call volume (Tcvol) is also significant itself, and can be interpreted to mean that for every additional call received, NUED visits increase by a fraction of a visit (0.0856). In other words, for every 11.7 calls received by TeleCare, NUED increases by one extra visit. Therefore, applying this coefficient to the combined total number of TeleCare calls observed during the 2 year pilot (N=75,248) indicates that about 6400 extra NUED visits were associated with TeleCare. Recognizing that a certain degree of statistical uncertainty still exists (i.e. standard error of $\beta 1$), we may wish to refer to an interval estimate instead. In this case, the number of extra NUED visits associated with TeleCare would range from between 2000 and 10000 overall (95% confidence interval). This range estimate is consistent with the earlier estimate of 9000 extra NUED visits projected by extrapolating historical trends.

[22] In a few instances, the volume of non-urgent visits was unavailable and had to be estimated (see section 2.0 and footnotes on Table 2 for details).

In conclusion, TeleCare does not appear to be related to any general decrease in NUED visits, and appears instead to be significantly associated with slightly higher NUED overall. This finding tends to obscure the real positive impact that TeleCare has apparently had on patient triage though. As mentioned above, regression analysis of non-urgent visits by presenting problem has revealed that TeleCare is associated with **fewer** NUED visits related to cold and flu symptoms, abrasions/ contusions/scratches, back and neck pain (no injury), otitis media, and post-op complications. On the other hand, it is associated with **more** visits for unspecified chest and abdominal and conditions, gastro-enteritis, suture removal and sprains / strains. These results would seem to indicate that TeleCare has had some impact on reducing deferrable NUED visits, while also increasing utilization for unspecified chest pain and other conditions which may be appropriately served in the ED setting. In short, it has changed the "type" of non-urgent visits being seen at ED towards a more "appropriate" mix of presenting symptoms.

5.4 To assess user's satisfaction with the service

Soon after TeleCare began operating in January 1995, a satisfaction survey was conducted at local emergency departments in Region 1 (see **Appendix E**). It revealed that 63% of non-urgent ED users were "very satisfied", and another 26% were "somewhat satisfied" with the overall quality of service on their most recent ED visit. Among those who were dissatisfied, a majority mentioned that ED waiting times were too long.

This compares with satisfaction surveys of the TeleCare service, conducted in July 1995 and March 1996, which both showed increased levels of satisfaction. In July 1995, a survey of 600 callers from across the Region indicated that 86% were "very satisfied" and another 12% were "somewhat satisfied" with the overall quality of the service. (Other ratings for specific aspects of the service such as quality of medical information received, and courtesy of the TeleCare nurse are provided in **Appendix F**). This survey was conducted prior to the implementation of the present "call-back" system which was introduced to reduce time spent waiting on-line.

Subsequently, in March 1996, a survey of 205 callers indicated that 89% were "very satisfied", and another 4% who were "somewhat satisfied" (see **Appendix G**). About 44% of these respondents found that the quality of the TeleCare service was "better than expected", with an additional 50% who found that it was "as expected". As an indication of whether TeleCare advice was understandable and practical, 97% of respondents said they were able to follow TeleCare's instructions; only 2% were unable to do so. For those calls which were not processed immediately, the average time for call-back was about 7 minutes. 89% of those surveyed felt that the time for call-back was not too long, although about 6% felt that it should be shorter.

In summary, it appears that TeleCare callers are generally very satisfied with the new service, compared to conventional service provided to Non-Urgent patients by local Emergency Departments.

5.5 To monitor the number of visits to physician's offices in Region 1

As indicated by the trend in **Figure 8**, the number of GP office visits made by Region 1 residents increased by 17,209 visits during TeleCare's first year of operation, rising from 482,189 in 1994 to 499,398 in 1995. In the following year however, the number of GP office visits in 1996 remained virtually unchanged, at 499,997 visits. The temporary spike upwards in 1995 was likely due to the addition of new physicians to the Region combined with the creation/expansion of several new walk-in clinics in the Moncton area. Population growth for the period 1995-1997 was only about 1.2%, which would not otherwise explain the increase (see visits per capita in Figure 8).

According to Medicare[23], there have been 12 new GPs added to Region 1 since January 1994. Due to retirements and aging however, their overall number and productivity in terms of billings (e.g. Full-Time Equivalents) has remained virtually unchanged (see **Figure 9**).

Conventional primary care provided as part of the regular scheduled GP office visit is expected to remain unaffected by TeleCare (e.g. physical exams, etc.), and TeleCare is therefore expected to mainly affect the number of visits made after hours to GP offices / Walk-In Clinics. Therefore, since the only two after hours clinics in the Region are in Moncton, any additional physician services generated by TeleCare are expected to come mainly from these two operations. In rural areas, visits to GP offices after hours are expected to remain largely unaffected, with most patients being directed to the local EDs after hours[24].

To examine the impact of TeleCare on after hours clinics in the Region, monthly visits to the St. George Street After Hours Clinic[25] were compared with TeleCare call volumes using regression analysis. Based on this analysis, which also accounted for seasonal variation and underlying trends, there was no statistically significant association observed (see **Appendix H**). Therefore, TeleCare does not appear to be associated with higher volumes of Walk-In Clinic visits in Region 1. This finding is tentative though, given the small sample size drawn from only one of the two available clinics.

Another similar regression was performed using data on office visits billed to Medicare by physicians registered at either Moncton clinic. This was intended to test for any significant changes in the volume of office visits as a whole, without regard to whether or not they were billed at an after-hours clinic. Once again, this indicated no significant association between monthly TeleCare calls and GP office visits (see **Appendix I**). These trends are shown in **Figures 10** and **11**.

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23 Personal communication: Lynne St. Pierre-Ellis, Medicare Division, N.B. Department of Health & Community Services.

24 According to Lucille Ste.-Jules, the TeleCare coordinator, TeleCare does not maintain lists of GPs who are open after normal working hours, and would therefore normally refer callers to the local ED if immediate physician services were required.

25 Based on utilization data provided by Dr. Ken Mitton.

Finally, to assess physician availability from the perspective of ED users, a question was added to registration forms at the major Emergency Departments in order to determine the percent of ED users who had tried to contact their family physician before coming to the ED. As indicated in **Table 3**, there does not appear to have been any change at the Moncton Hospital, with about 92% of ED users indicating that they had not tried to contact their physician before coming[26]. The remaining 8% of ED users indicated that they had tried, but their family physician was unavailable for an appointment. An earlier survey, conducted at the Moncton Hospital ED in February 1994, revealed that 95% of ED users had a family doctor.

[26] At the other large Moncton hospital, the Georges Dumont, coding inconsistencies and incomplete data have produced results that are too unreliable for meaningful interpretation.

5.6 To assess the cost-effectiveness of the telephone triage mode of service delivery

This part of the evaluation will be addressed in two parts, in response to the following underlying questions:

a) ***Has TeleCare decreased the cost of health care to the province?*** **(Cost-minimizing)**

b) ***Does TeleCare offer good value-for-money compared to other options for treating deferrable non-urgent symptoms?*** **(Cost-effectiveness)**

The choice of perspective for the economic analysis is an important initial consideration, in order to determine which costs and benefits to include. In the simplest instance, the payor perspective of the Department of Health and Community Services can be used, which excludes out-of-pocket costs borne by private citizens and other costs to society which transcend the Departmental budget. (Another more comprehensive analysis from the broader perspective of society at large is contained in **Appendix A**).

Before proceeding to consider various costs and benefits in detail, it is useful to address the issue of how to measure TeleCare's effective output. Since TeleCare is not intended to target specific types of non-urgent symptoms or conditions, the various options for comparison here do not refer to case-specific outcomes, but rather to system-wide results. Pre-existing conditions will therefore be compared with subsequent conditions and outcomes following the implementation of the TeleCare service, in order to determine the incremental costs and benefits associated with operating the service. In this case the economic analysis will refer to net incremental costs and benefits resulting from the introduction of TeleCare, compared to the status quo, rather than estimating average costs and benefits prevailing in each case. In other words, it intends to show the gains in productivity and effectiveness per dollar of extra resources required to accomplish those gains.

Effective utilization will be measured by the number of calls triaged, rather than the total number of calls received. This is a better indicator of TeleCare's intended role, and excludes certain "information only" calls which are not directly related to TeleCare's mandate. There were about 64,000 calls triaged over the course of the 2 year pilot, whereas there were none previously. Of these, about 89% of callers were very satisfied with the quality of the service (see section 5.4) and over 97% were able to successfully follow TeleCare's instructions over the phone[27]. While user satisfaction is an important aspect of service, effective utilization also depends on the clinical appropriateness of actual TeleCare advice.

5.61 Appropriateness of Call Dispositions

The clinical appropriateness of TeleCare call dispositions has been evaluated using physician judgement as a "gold standard" for performing a case review. This review tested the level of

[27] According to a satisfaction survey of TeleCare callers, conducted in March 1996

agreement between the TeleCare nurse's judgement and that of physicians concerning TeleCare referrals to ED and GP offices/Walk-In Clinics.

For this purpose, two teams of clinicians were assembled, headed by the chief Emergency physicians from both the Georges Dumont[28] and the Moncton Hospital[29]. Based on a sample of randomly selected cases chosen by the evaluators, each team conducted independent clinical reviews of the log notes and other information available to the TeleCare nurse at the time of the call. On this basis, they determined whether the call disposition selected by the TeleCare nurse was clinically appropriate in light of the circumstances. By comparing the resulting assessments for each case, the level of physician agreement with nurse dispositions was established, as well as an indication of the inter-rater agreement between the two clinical review teams. As indicated below and in **Appendix J**, this clinical review demonstrated that the TeleCare triage process is generally appropriate and consistent.

- For those cases referred to the **Emergency Department**: 79% were found to be unequivocally appropriate according to both assessment teams, another 13% were deemed appropriate by 1 team but not the other (i.e. equivocal / disagreement) [30]. The remaining 7.7% of cases were deemed to be more appropriately referred to: physician / Walk-In clinic within 24 hours (3.9%), or other scheduled GP office visit (3.9%).

- For those cases referred to the **GP / Walk-In Clinic for service within 24 hours**: 83.3% were unequivocally appropriate according to both assessment teams, another 3.3% were deemed appropriate by 1 team but not the other (i.e. equivocal / disagreement). The remaining 13.3% of cases were deemed to be more appropriately referred to: Emergency Department (3.3%), and Home Care (10%). The first team actually reviewed more cases than the other; for the larger sample of 91 cases reviewed by team 1, there was still only 1 case that should have gone to the Emergency Department (i.e. the same case that was used for inter-rater comparisons). On this basis, the percent of dispositions that would have been more appropriately referred to Emergency Department may actually be less than 3.3%.

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28 Dr. André Touchburn

29 Dr. Peter O'Hanley

30 To test inter-rater agreement, a weighted kappa score was calculated for the exercise. It resulted in a value of 0.70 for ED dispositions and a value of 0.96 for dispositions to GP / Walk-In clinic within 24 hours. Where perfect agreement would be 1.0, these resulting values show a relatively high degree of inter-rater agreement or correlation between the reviewing groups. Given the number of cells involved in the assessment, and the sample sizes reviewed by both groups (n=30 for ED; n=50 for GP/Clinic), these results for weighted kappa reflect a 95% level of statistical significance (alpha=0.05, accurate 19 times out of 20).

5.62 Direct Costs and Benefits

The economic evaluation of TeleCare will consider direct financial costs, as well as other indirect costs, tertiary costs and benefits. In the simplest case, from the perspective of the Department of Health and Community Services, these costs and benefits are largely reduced to the direct (financial) costs associated with building or operating the service[31], and the potential direct cost savings arising from triaging callers to less costly sources of care. This is a measure of the resources required as inputs in order to produce the service. If a broader societal perspective were used, other indirect costs related to production losses such as wage costs associated with waiting time, and other intangible costs such as psychic pain and similar unquantifiable consequences would also apply.

As indicated in **Table 4**, the Direct Cost associated with constructing and operating TeleCare itself over the 2 year pilot project is **$1,330,769** -- or about $20.80 per triaged call. This average figure for operating cost includes the initial start-up costs for commissioning TeleCare subject to the scope of the Region 1 pilot and the resulting call volume. Some of these start-up costs are one-time in nature, that is, fixed costs which are unrelated to call volume in the short run. Other cost components as well, such as the salary of the ED physician advisor, are also fixed and unrelated to the volume of calls. In the long run, if TeleCare were to expand, the cost per call would therefore likely decrease with larger volumes of service due to economies of scale. If the service were expanded beyond the 64,000 triaged calls observed during the pilot, the marginal direct cost per additional call would likely fall below the $20 observed average cost, to as low as $5 per additional call[32]. For the purpose of costing this pilot project though, we will adopt the conservative assumption that no economies of scale apply in the short run, and that marginal direct operating cost equals the $20.80 average operating cost observed for the pilot.

5.63 Triage Savings: Referrals to Less Costly Sources of Care

Whereas the TeleCare budget can be readily measured, other costs are relatively uncertain and must be estimated. For instance, the cost of a typical non-urgent ED (NUED) visit in Region 1 is unknown, since local hospitals do not capture and compile financial data by acuity level. The average cost per NUED visit has therefore been estimated to range between $69 and $85 per visit,

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31 Note that costs refer to 1995/96 dollars; discounting of various costs and benefits, and depreciation of fixed assets has not been explicitly introduced because of the short 2 year timeframe for analysis. Any variance in this respect is likely subsumed within the confidence interval around the cost estimates.

32 Based on 9 minutes per answered call, a nurse working 1950 hours per year can answer 17,550 calls. If her salary is about $41,000, then the staff cost per call is about $2.34 -- provided staffing is flexible enough to accommodate the peak loading due to uneven call volume during the day. Assuming that nurses only spend half of their time actually answering calls (otherwise documenting calls or in training), this would double the cost per staff per call to $4.68. Added to this basic staffing cost would be other capital costs for workstation, phonelines and other equipment which would amount to another $5,000-7,000 per nurse, or an extra $0.40 per call.

based on benchmarks from recent studies[33]. With this in mind, what is actually required is not the average cost per visit, but a measure of the "marginal cost", that is, the cost of the next successive visit. This is because many of the costs associated with operating an ED are "sunk" costs which are insensitive to the volume of service (e.g. capital equipment, physician salary)[34]. On this basis, the marginal cost of Non-Urgent ED visits has been estimated recently by Williamson[35] at $25 (U.S.) per visit, or about $32 in equivalent Canadian dollars. This figure will be used to cost changes in NUED utilization due to TeleCare.

The number of additional NUED visits associated with TeleCare has already been estimated in section 3.3. This analysis indicated a relative increase of between 2,000 and 10,000 more non-urgent ED visits over the two year period, or a point estimate of 9000 more NUED visits based on simple extrapolation. Costed at $32 per visit, 9000 extra NUED visits would add about **$288,000** more in ED expenses for the 2 years combined. This figure of $288,000 assumes that callers would have otherwise cost the health care system nothing though, which is not generally true. Some callers who were directed to the ED by TeleCare would have otherwise gone to a Walk-In Clinic or a GP's office. Therefore, this could be considered as a "worst case" scenario for the impact of TeleCare on service referrals, since otherwise no significant changes were observed in physician office visits.

What is required for economic costing then, is the net increased cost based on the difference between where callers were sent by TeleCare and where they would have otherwise gone for service, if any. This is a measure of "opportunity cost" in economic terms, and is referred to in **Tables 5** and **6** as the potential cost savings of call triage. (Later, it will be added to the basic operating cost per call, that is $20.80, in order to provide a total combined estimate of opportunity cost for TeleCare). For those who would have otherwise gone to NUED but who were referred by TeleCare to a Walk-In Clinic, the potential cost savings is the difference between the marginal cost of a NUED visit ($32)

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33 "Estimating the Cost of Outpatient Care", P. Jacobs et al, Alberta Health, 1995; R. Williamson NEJM, op cit; Terry Campbell (CIHI) - personal communication re: outpatient rehab costs range between $30-$120 per visit.

34 Since EDs must be staffed on a 24 hour basis anyway, it is likely cost-effective to maintain some basic level of non-urgent visitation in the ED, even with a successful TeleCare service. Where the ED is not operating at peak capacity, the marginal cost of serving one more non-urgent patient in ED could even be less than it would cost in either a walk-in clinic or physician's office (i.e. less than $20 per visit). When the ED is not busy, the marginal cost of serving an extra non-urgent patient would amount to the extra materials and supplies required for the visit. (Virtually no wage costs would be involved since ED staff are effectively a fixed cost). As long as this ancillary cost does not exceed the cost of serving that same patient in a different setting (i.e. office visit), then it will be cost-effective to continue serving that non-urgent patient in ED. This condition holds as long as the ED is not busy, but breaks down as non-urgent volumes increase to the point where the ED becomes congested and non-urgent patients begin to interfere with the essential services provided to urgent ED cases. For this reason, the cost of extra Non-Urgent ED visits will tend to be less than the average cost of all preceding visits.

35 "The Costs of Visits to Emergency Departments", Robert Williamson, NEJM, March 1996

and the marginal cost of a Walk-In Clinic visit ($20)[36] -- that is, a savings of $12 per call of this type. In the case where the caller received only Home Care advice, the potential cost savings is the difference between the $32 NUED visit and the cost of providing info by the TeleCare nurse. For these persons who received only telephone advice and who were not referred to another health care provider, the marginal cost of phone advice is effectively nil, since it is already reflected in the marginal operating cost identified above as $20.80 per call. Therefore, the cost savings for callers who received Home Care advice instead of NUED is $32 - $0, or $32 per call.

But not all calls being triaged by TeleCare will result in potential cost savings: some callers may be appropriately referred to more costly sources of care. For instance, those persons who would have otherwise gone to see their family physician, but who were directed to go to the ED would have their cost increase from $20 for a GP office visit, to $32 for a NUED visit -- an increase of $12 per call. Such cases could include those with undiagnosed chest pain or abdominal conditions which require hands-on diagnosis or timely testing.

Overall, in order to address the net potential cost savings from all TeleCare referrals, **Table 5** compares TeleCare disposition with what callers' would have otherwise done without TeleCare, based on a survey of 595 TeleCare users[37]. For example, it shows that about 61% of callers to TeleCare would have otherwise visited the ED, but that only 21% of this sub-group of callers were ultimately referred to the ED by TeleCare. The remainder were sent to Walk-In Clinics, GP offices, or given Home Care advice or information only.

Table 6 proceeds to inflate the survey sample to reflect the total actual volume of TeleCare calls by disposition for the 2 year pilot, and estimates the potential cost savings per call for each separate cell on the table. It then proceeds to calculate the total cost savings for each cell, by multiplying the call volumes by the respective cost savings per call. For instance, there were an estimated 15,942 calls sent to Walk-In Clinics that would otherwise have gone to the ED. At a cost savings of $12 per call, this produces a total cost savings for those calls amounting to about $191,000. In another case, where callers were redirected from Walk-In Clinic to the ED, there was a cost increase of $12 per call for an estimated 452 visits. This amounts to an additional cost of about $5,400[38]. In conclusion, when the costs and savings have been summed for various cells across the entire Table 6, the overall

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36 Costed at $20 per visit based on 1995 / 1996 fees for GP office visit.

37 This was based on a telephone survey conducted in July 1995 by Corporate Research Associates.

38 For other cases where callers indicated that they would have otherwise "called the hospital" or "called the family doctor" the cost implications are relatively uncertain since it is not obvious whether their call would have eventually resulted in an actual visit or not. In these cases, the cost savings per call has been based on a mid-range value for possible outcomes. As an example, those callers who said they would have called the family doctor and who were directed to a Walk-In Clinic may have resulted in no additional cost (if their initial call would have otherwise resulted in a GP office visit), or it may have cost $20 more (if their initial call to the GP's office would not have resulted in a GP visit). Therefore, when costing these calls, an average cost of $10 per call has been used.

total indicates that call triaging by TeleCare has resulted in a net cost savings amounting to about **$713,000** for the entire 2 year period. This estimate should be viewed as a "best case" scenario, or an upper bound on potential cost savings due to call triage though, for two reasons. First, the results assume that callers' stated intentions about "what they would have otherwise done without TeleCare" are accurate, and consistent with their actual behaviour in those circumstances. This may not be entirely true though, and survey respondents may have simply indicated that they "would have visited ED" for lack of a more thought-out response. Secondly, the results of Table 6 assume that callers actually comply with the TeleCare instructions, and go where they are referred for service. Not all will necessarily comply with these instructions. Some callers may seek a second opinion, or their physician may be unavailable for an appointment. As a result, some of those who are given home care instructions, or who are told to see their family physician, may ultimately end up at the ED. In fact, based on the change in referral patterns in Table 6, the volume of ED visits would be expected to decrease by about 30,000 visits. This contrasts with actual experience, where NUED trends in the Region have actually increased slightly, as outlined earlier[39]. (The impact of non-compliance with TeleCare dispositions is explored in greater detail later in section 6.1).

In conclusion, the total increase in Direct Cost due to TeleCare is therefore estimated as the difference between the **$1,330,769** operating cost previously mentioned, and any potential cost savings due to referrals to less costly sources of care. In the "best case" scenario, using the results from Table 6, this amounts to savings of about **($713,000).** In the "worst case" scenario, where TeleCare has apparently added 9000 extra NUED with no other significant change in health care utilization, this amounts to additional cost of about **$288,000.** Depending on which scenario applies, this amounts to an overall net incremental cost of either **$618,000** or **$1,619,000** for the entire 2 year pilot. Regardless which scenario is used, we therefore conclude:

> **a)** ***TeleCare has not decreased the cost of health care to the province.*** **It is an "add-on" to the provincial health care budget.**

5.64 Cost-Effectiveness

The cost-effectiveness of TeleCare refers to the cost per unit of effect. Often, effectiveness units refer to measurable health outcomes in terms of life years gained or increased functionality (e.g. range of movement) for specific treatment options[40]. In this case, where the range of non-urgent conditions is non-specific, and largely non-life-threatening, a global measure of effectiveness is

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39 Also, according to results from a supplementary question added to ED registration, about 21% of NUED visitors had used TeleCare during the period April-July 1995, rising to about 40% NUED visitors by April 1996. Applying these percentages to total NUED for Region 1 would suggest a total of about 65,000 NUED visits for TeleCare callers over the 2 year pilot.

40 Note that is measures the change in the quantity of service being provided, but does not explicitly address any changes to quality of life or well-being as a result of the new service.

required. In principle, what is required is a measure of the additional non-urgent contacts with the health care system after introducing TeleCare, including extra visits to ED, physicians offices, after-hours clinics and triage calls to TeleCare. Since no apparent association exists between TeleCare and physician/clinic visits, and since the slight positive impact on NUED is uncertain, the impact of TeleCare on these two components will be assumed to be nil. So, the number of additional non-urgent contacts will correspond with the number of triaged calls to TeleCare (excluding information only calls). This is a conservative assumption, since adding any extra NUED contacts will serve to increase the measure of incremental effectiveness as a denominator in cost-effectiveness ratios. Therefore, for each costing scenario, the cost-effectiveness ratio is:

"Best case scenario"

- **$618,000** Net Incremental Cost divided by **64,000** triage calls = **$9.66 per triage call**

"Worst case scenario"

- **$1,619,000** Net Incremental Cost divided by **64,000** triage calls = **$25.29 per triage call**

In the "best case" scenario, the marginal cost per non-urgent contact with TeleCare is less than either the marginal cost of a Walk-In Clinic visit ($20 per GP office visit), or a Non-Urgent Emergency Department visit ($32 per visit). It is therefore relatively cost-effective compared to either of the alternatives. In the "worst case" scenario, the results are more ambiguous. A health care system which includes TeleCare is still less costly than NUED, but it is more costly than a GP/Walk-In Clinic visit. In this case, it is important to note that TeleCare has certain other additional benefits which are not explicitly reflected in these cost-effectiveness ratios, as outlined below in section 5.65 and Appendix A. For this reason, and because the marginal cost of operating TeleCare is apt to decrease when the service expands province-wide (i.e. due to economies of scale), we conclude:

> **b)** ***TeleCare is potentially cost-effective and offers good value-for-money compared to other "status quo" options for treating deferrable non-urgent symptoms.*** **(The increased levels of satisfaction reported by TeleCare callers compared to that for Emergency Department visitors also serves to reinforce this conclusion.**

5.65 Other Intangible Costs and Benefits

In addition to those dollar figures identified in **Table 4**, there are several other intangible costs and benefits which affect TeleCare's value. These effects cannot be easily quantified in dollar terms[41], but are still worth considering as significant parts of the economic analysis:

1. The value of improved timely access to advice by phone regarding Non-Urgent symptoms, especially for rural residents, is a benefit in terms of enhanced quality of care. (This is in

[41] See Appendix A for discussion of "Option Value" associated with willingness-to-pay for enhanced benefits from society's perspective.

addition to the time savings obtained through avoiding travel costs en route to unnecessary ED / Walk-In Clinic visits and associated waiting time outlined in Appendix A).

2. In addition to the potential cost savings from triage, there is also the benefit of improved triage among urgent ED patients seeking advice and treatment as a result of fewer persons presenting there with non-urgent symptoms. A number of avoidable trips would have added to increased numbers at Emergency Departments.

3. There is also a benefit associated with those legitimate cases who were referred by TeleCare for timely consultation at the ED / Walk-In Clinic who would have otherwise avoided or delayed their contact with the health care system, with potential adverse consequences. **Table 5** shows that about 10% of persons ultimately referred to ED by TeleCare would have otherwise "asked family /friends" or engaged in "watchful waiting".

4. According to the clinical case review described in section 5.61, nursing triage is generally appropriate and effective. There were about 3% of cases referred to GP office/Walk-In Clinics though, that should have been sent to the ED. This constitutes an intangible cost.

6.0 FURTHER RESEARCH

6.1 Did Callers Actually Go Where They Were Instructed?

The potential cost savings from referrals to less costly sources of care in Table 6 assumes that callers are perfectly compliant in terms of following the advice/disposition given by TeleCare. But did they really comply with the home care advice, or did they proceed to visit the ED anyway? In order to test the extent of this caller non-compliance, a file matching analysis was conducted using a small sample of 111 callers drawn as part of a satisfaction survey in March 1996. In this analysis, TeleCare callers living in the Moncton area were matched (by Medicare id, name and date of birth) against: ED visits from both Moncton hospitals within 48 hours of the call; and GP office visits within 48 hours of the TeleCare call using the Medicare database. As indicated below, results appear to indicate that not all callers complied with their TeleCare referral:

For those who were directed to go to ED immediately:

- About 87% of cases were seen within 48 hours at ED or GP office/ Clinic within 48 hours of the call. The remaining 13% of sampled cases were non-compliant, and did not show up at ED or GP office/ Clinic.

For those who were directed to see a physician within 12 to 24 hours (including Walk-in Clinic):

- About 50% of sampled cases did show up within 48 hours of the call as a physician contact, but the other half were non-compliant: 10% showed up as an ED visit, and the remaining 40% did not show up as either.

For those who were provided Home Care advice:

- About 59% of sampled cases complied, and did not show up within 48 hours of the call as either an ED visit or a GP office/ Clinic visit. Of those who did not comply, 15% showed up as an ED visit, and 26% showed up as a physician contact or combined physician/ED contact.

This file matching exercise is somewhat limited by the small sample size, but nonetheless serves to show the level of patient compliance with various TeleCare dispositions. This file-matching analysis will likely be expanded in the next phase of the TeleCare evaluation, once more extensive data about "what users would have otherwise done without TeleCare" is available from the expanded TeleCare database.

7.0 CONCLUSIONS

1. Public awareness of the TeleCare service has increased over the course of the pilot study. Among non-urgent visitors to major Emergency Departments in Region 1, **over 60% of ED respondents surveyed were aware of TeleCare as of October 1996**.

2. Public acceptance and utilization of the new service has grown over the course of the study. There have been over 73,000 calls to TeleCare over the 2 years since January 1995. This equates with about 32,000 new unique callers, or about **1 in every 5 residents (i.e. 18%)**. In rural areas, it appears that French-speaking callers in the North of Region 1 are among the highest users; in the Moncton area, English-speaking users tend to predominate.

3. Regression analysis of non-urgent visits by presenting problem has revealed that TeleCare is associated with **fewer** NUED visits related to cold and flu symptoms, abrasions/contusions/scratches, back and neck pain (no injury), otitis media, and post-op complications. On the other hand, it is associated with **more** visits for unspecified chest and abdominal conditions, gastro-enteritis, suture removal and sprains / strains. These results would seem to indicate that TeleCare has had some impact on reducing deferrable ED visits, while also increasing utilization for unspecified chest pain and other conditions which may be appropriately served in the ED setting. **Overall though, TeleCare is not associated with any general decrease in Non-Urgent ED visits, and appears to be associated with slightly higher NUED**. It should be noted however, that this finding tends to obscure the real positive impact that TeleCare has apparently had on **improving patient triage**.

4. It appears that TeleCare callers are generally very satisfied with the new service, compared to conventional service provided to Non-Urgent patients by local Emergency Departments. Based on a satisfaction survey of the TeleCare service conducted in March 1996, **about 89% of callers were "very satisfied"**, with an additional 4% who were "somewhat satisfied". About 44% of respondents found that the quality of the TeleCare service was "better than expected", with an additional 50% who found that it was "as expected". 97% of respondents said they were able to follow TeleCare's instructions, only 2% were unable to do so.

5. According to Medicare, there have been 12 new GPs added to Region 1 since January 1994. Due to retirements and aging however, their overall number and productivity in terms of billings (e.g. Full-Time Equivalents) has remained virtually unchanged. The need for face-to-face primary care provided as part of regular scheduled GP office visits (e.g. physical exams, etc.) is not expected to change due to TeleCare. Rather, TeleCare is expected to affect mainly the number of unscheduled visits made after hours to GP offices / Walk-In Clinics for "deferrable" non-urgent conditions. Visits to GP offices after hours in rural areas also expected to remain largely unaffected, with most patients being directed to the local EDs after hours. To examine the impact of TeleCare on after hours clinics and GP office visits, regression analysis was used to test for significant changes in underlying trends. Based on these two analyses, which also accounted for seasonal variation and underlying trends, there

was no statistically significant association observed in either case. **Therefore, TeleCare does not appear to be associated with higher or lower volumes of Walk-In Clinic visits, or GP office visits**.

6. **a) TeleCare has not decreased the cost of health care to the province. It is an "add-on" to the provincial health care budget.** The total increase in Direct Cost due to TeleCare is estimated as the difference between the **$1,330,769** operating cost over the 2 year pilot, and any potential cost savings due to referrals to less costly sources of care. In the "best case" scenario, where telephone triage has apparently had a significant impact of service referrals as per Table 6, this amounts to savings of about **($713,000).** In the "worst case" scenario, where TeleCare has apparently added 9000 extra NUED with no other significant change in health care utilization, this amounts to additional cost of about **$288,000.** Depending on which scenario is chosen, this amounts to an overall net incremental cost of either **$618,000** or **$1,619,000** for the entire 2 year pilot. In both cases, it has increased the cost of health care to the Department.

b) TeleCare is relatively cost-effective and offers good value-for-money compared to other "status quo" options for treating deferrable non-urgent symptoms. (The increased levels of satisfaction reported by TeleCare callers compared to that for Emergency Department visitors also serves to reinforce this conclusion). Cost-effectiveness refers to the cost per unit of effect. Often, effectiveness units refer to measurable health outcomes in terms of life years gained or increased functionality (e.g. range of movement) for specific treatment options. In this case, where the range of non-urgent conditions is non-specific, and largely non-life-threatening, a global measure of effectiveness will be used -- the number of triaged calls (excluding information only calls). The costing perspective in this case is that of the Department of Health and Community Services. Therefore, for each scenario, the cost-effectiveness ratio is:

"Best case scenario":
$618,000 net incremental cost divided by **64,000** triage calls = **$9.66 per triage call**

"Worst case scenario":
$1,619,000 net incremental cost divided by **64,000** triage calls = **$25.29 per triage call**

In the "best case" scenario, the marginal cost per non-urgent contact with TeleCare is less than either the marginal cost of a Walk-In Clinic visit ($20 per GP office visit), or a Non-Urgent Emergency Department visit ($32 per visit). In the "worst case" scenario, it is still less costly than NUED, but more costly than a GP/Walk-In Clinic visit. It should be noted though, that TeleCare has certain other additional benefits which are not explicitly reflected in these cost-effectiveness ratios, as outlined below in section 5.65, and in Appendix A. For this reason, and because the marginal cost of operating TeleCare is apt to decrease when the service expands (i.e. due to economies of scale), we conclude that TeleCare is cost-effective.

8.0 RECOMMENDATIONS

1. Since American-based clinical protocols in TeleCare's "Centramax" software may not necessarily coincide with current Canadian standard practice, case reviews of various specific conditions should be explored to see whether existing clinical guidelines in "Centramax" can be improved. (The Department does not currently have a copy of the guidelines being implemented by TeleCare on its behalf by Clinidata, apparently due to copyright restrictions).

2. The evaluation revealed that multiple ids were recorded for about 7% of TeleCare callers, based on those who had been double-registered. This creates a problem of data quality, which should be addressed through a regular monthly "merge and purge" of the registry dataset. This will avoid any duplication of case ids.

3. The Centramax database records information by caller and call, but there is no data entity to link related episodes of care. For instance, a person can call twice in the same day about the same complaint. It would be useful to create a new data field to identify whether the caller is calling about a "new case / episode" or is merely getting follow-up from an earlier call.

4. About 6% of TeleCare callers identified for case review could not be identified using the Medicare dataset for Region 1. Since TeleCare is a front-end data collection system which will record updated information by place of residence on an ongoing basis, their data registry will become more accurate and relevant than the official Medicare registry database (which requires only that people update personal information when they renew their card every 5 years). This TeleCare information regarding current place of residence should be downloaded to the Department at regular intervals, for use in various Epidemiological and planning studies as a flexible population denominator (i.e. alternative to Statistics Canada inter-censal estimates).

5. Since callers' compliance with the TeleCare referral is an important aspect regarding the effectiveness of the service, it is recommended that further study may be warranted to explore the extent of non-compliance, and the reasons for it.

6. As callers become more knowledgeable and feel more secure with the TeleCare service, it is likely that the scope for self-care at home by the client will expand. This should be monitored over time, and included as a part of the next phase of the TeleCare evaluation.

7. Given the positive nature of the response, this model could be considered for expansion to other areas.

8. It is recommended that this report be approved for release.

Tables

Table 1

Call Volume & Rate by Community

(Sorted by Mother Tongue 1991 Census)

Community	Telephone Exchange	'91 Census Population	(4 Months) Sept-Dec'96 Calls	Average Monthly Call Rate per 1000 Pop	%English Mother-Tongue (1991 census)
Saint-Antoine	525	1,380	443	80.3	5%
Saint-Louis-de-Kent	876	7,380	728	24.7	6%
Buctouche/Cocagne	955,743,576	13,025	2,536	48.7	13%
Shediac	532,533	12,595	2,300	45.7	21%
Memramcook/Dorchester	758, 379	6,265	862	34.4	27%
Cap-Pelé	577	5,230	1,018	48.7	31%
Richibucto	523	7,725	623	20.2	37%
Moncton / Riverview / Dieppe	**382-389 (not 385) 851-859 861-864, 866 867 872 877**	**95,685**	**14,584**	**38.1**	**65%**
Fords Mills (Harcourt PAR)	785	465	229	123.1	66%
Port Elgin	538	1,570	84	13.4	93%
Sackville	364,536	6,730	250	9.3	94%
Salisbury	372	5,250	458	21.8	96%
Peticodiac/Havelock	756, 534	2,280	339	37.2	97%
Hillsborough	734	2,715	257	23.7	97%
Albert	882	1,715	30	4.4	98%
Alma	887	310	16	12.9	98%
TOTAL		**170,320**	**24,757**	**36.3**	**55%**

Greater Moncton Area		'91 Census Average Household Income	'91 Census Population	Ja'95-Apr'96 Calls (1)	Monthly Call Rate per 1000 Pop	%Francophone Calls (2)
Dieppe / Moncton	E1A	$42,967	23,380	5,444	14.6	49.4%
Riverview	E1B	$51,767	14,940	2,329	9.7	4.5%
Moncton	E1C	$34,592	24,105	8,426	21.8	23.1%
Moncton	E1E	$50,451	11,115	1,554	8.7	10.8%
Moncton	E1G	$54,466	5,740	1,181	12.9	20.7%
			79,280	18,934	14.9	27.3%

Note: (1) = Calls where language of caller was recorded (about 75% of calls)
(2) = francophone as % total francophone & anglophone calls (excludes missing)

Table 2

Non-Urgent Emergency Department Visits: Region 1

NUED Visits by Facility

		1992	1993	1994	1995	1996 (1)
	The Moncton Hospital (1)	53,707	51,723	44,206	41,613	37,405
	Georges Dumont (2)	37,595	36,988	33,399	32,479	33,518
	Ste. Anne de Kent (3)	21,040	21,513	21,234	19,704	21,083
	Sackville Hospital (4)	16,396	16,743	14,778	15,709	14,445
A)	**TOTAL NUED Visits: Region 1**	**128,737**	**126,967**	**113,618**	**109,505**	**106,451**
B)	Region 1: Population ('000s)	177.9	179.0	180.2	181.3	182.4
C)=A / B	**TOTAL NUED Visits / '000 Pop.**	**724**	**709**	**631**	**604**	**584**

Overall Changes

	Change in Total NUED	Change in NUED Rate /'000 Pop	Annual Avg. Decrease in Rate (C)
Pre-TeleCare (Jan'92 to Dec'94)	**-15120**	**-93**	**-6.7%**
Since TeleCare (Jan' 95 to Dec'96)	**-7166**	**-47**	**-3.8%**

Projected Impact

		1995	1996	Combined 1995 &'96
D)	Projected Rate @ pre'95 trend	589	549	--
B)	Region 1: Population ('000s)	181.3	182.4	--
E)=D X B	**Projected NUED without TeleCare**	**106,701**	**100,202**	**206,904**
A)	Actual Observed NUED with TeleCare	109,505	106,451	215,956
F) = A - E	**Difference in Projected - Observed**	**2,804**	**6,249**	**9,052**

Note: (1) = TMH Non-Urgent for Aug - Dec 1996 is based on MediTech data; prior based on other info system, also by acuity;
(2) = GD Non-Urgent for 1992,94,95,96 from ED stats, for '93 from HS1s and 74% Non-Urgent interpolated from '92 & '94
(3) = Ste. Anne de Kent NUED for 1994,1995 & 1996 based on actual visits by acuity code; otherwise for 1992 & '93 from 74% Non-Urgent rate prevailing in 1994 applied to Total ED from StatsCan HS1 data for 1992 & '93
(4) = Sackville NU based on 84% of total ED visits observed in Non-Urgent survey Dec 8/94 to Jan 13/95, applied to total ED

Note: rates have not been age-standardized due to lack of detailed data

Table 3

Physician Availability for Appointment

According to Surveyed Emergency Department Users

Was your doctor available for an appointment today?

The Moncton Hospital	Baseline 10 Dec '94 to 14 Jan '95	post-TeleCare month of Jan 1996
1) did not attempt to contact the physician before coming	91%	92%
2) not today or tomorrow	6%	7%
3) not for 3 or more days	1%	0%
4) not at all (e.g. on vacation)	2%	1%
Number of persons asked =	3254	1854
Respondents as % Total ED users	60%	40%

Was your doctor available for an appointment today?

Georges Dumont Hospital	Baseline 2 Dec '94 to 14 Jan '95	post-TeleCare month of Mar 1996	Adjusted* Baseline 2 Dec '94 to 14 Jan '95	Adjusted* post-TeleCare month of Mar 1996
1) did not attempt to contact the physician before coming	52%	12%	97%	48%
2) not today or tomorrow	1%	0%	1%	1%
3) not for 3 or more days	1%	0%	2%	2%
4) not at all (e.g. on vacation)	0%	13%	0%	49%
5) not applicable (& non-response)	47%	74%		
Number of persons asked =	4031	2750		
Respondents as % Total ED users	100%	71%		

* = Adjusted for % non-response by those responding (i.e. excluding category 5 responses)

Note: Georges Dumont did not fully implement the supplementary questions until after Jan 1996

Table 4

Net Incremental Cost of TeleCare Service

(Public Payor Perspective)

1) TeleCare Direct Operating Expenses:

	1994/95	1995/96	1996/97	Combined Total
Start -up / Commissioning	$156,682	–	–	$156,682
Nurse salaries & benefits (a)	$220,573	$429,407	$378,533	$1,028,513
Medical salaries		$18,000	$12,960	$30,960
Telephone		$35,166	$22,500	$57,666
Ads, stickers (b)	$2,308	$9,746	$375	$12,429
Other		$33,569	$10,950	$44,519
TOTAL	$379,563	$525,888	$425,318	

(a) = equates with 11.5 FTEs RN2 & 1 FTE RN4 (Mar 96), only 8.5 FTEs RN2 prior

(b) = includes promotions paid directly by Dept Health & Community Services

Sub-Total = **$1,330,769**

2) Potential Cost Savings from Appropriate Referrals to Less Costly Sources of Care:

a) "Best case" Scenario: all callers fully comply with disposition **($713,141)**

Net Sub-Total = **$617,628**

b) "Worst Case" Scenario: based on 9000 extra NUED at $32 each **$288,000**

Net Sub-Total = **$1,618,769**

Table 5: What would you have otherwise done without TeleCare?

Action Otherwise	TeleCare Referral Disposition: Emerg. Dept/ Activate 911	Walk-In Clinic / See Dr. in < 24 hrs	See Dr. in 72 hrs / Dr. Regular Appt't	Home care	Info only / Call Pharmacy	
Visit Emerg. Dept.	73	133	12	96	35	349
Column Percent	60.8%	61.6%	42.9%	63.6%	58.3%	
TOTAL Percent	12.7%	23.1%	2.1%	16.7%	6.1%	60.7%
Visit Walk-In Clinic	4	11	1	2	1	19
Column Percent	3.3%	5.1%	3.6%	1.3%	1.7%	
TOTAL Percent	0.7%	1.9%	0.2%	0.3%	0.2%	3.3%
Visit Family Dr.	7	4	3	4	0	18
Column Percent	5.8%	1.9%	10.7%	2.6%	0.0%	
TOTAL Percent	1.2%	0.7%	0.5%	0.7%	0.0%	3.1%
Call Family Dr.	9	25	8	26	9	77
Column Percent	7.5%	11.6%	28.6%	17.2%	15.0%	
TOTAL Percent	1.6%	4.3%	1.4%	4.5%	1.6%	13.4%
Call hospital	15	24	2	17	11	69
Column Percent	12.5%	11.1%	7.1%	11.3%	18.3%	
TOTAL Percent	2.6%	4.2%	0.3%	3.0%	1.9%	12.0%
Ask family or friends	1	5	2	2	0	10
Column Percent	0.8%	2.3%	7.1%	1.3%	0.0%	
TOTAL Percent	0.2%	0.9%	0.3%	0.3%	0.0%	1.7%
Call Pharmacy	0	1	0	1	1	3
Column Percent	0.0%	0.5%	0.0%	0.7%	1.7%	
TOTAL Percent	0.0%	0.2%	0.0%	0.2%	0.2%	0.5%
Watchful Waiting	10	11	0	3	1	25
Column Percent	8.3%	5.1%	0.0%	2.0%	1.7%	
TOTAL Percent	1.7%	1.9%	0.0%	0.5%	0.2%	4.3%
Other	1	2	0	0	2	5
Column Percent	0.8%	0.9%	0.0%	0.0%	3.3%	
TOTAL Percent	0.2%	0.3%	0.0%	0.0%	0.3%	0.9%
TOTAL	120	216	28	151	60	575
TOTAL Percent	20.9%	37.6%	4.9%	26.3%	10.4%	

Table 6: Cost (Savings) due to Triaging of Calls to TeleCare

based on Calls received Jan '95 to end Dec '96

Action Otherwise	TeleCare Referral Disposition: Emerg. Dept/ Activate 911	Walk-In Clinic / See Dr. in < 24 hrs	See Dr. in 72 hrs / Dr. Regular Appt't	Home care	Info only / Call Pharmacy	
Visit Emerg. Dept.	8254	15942	1824	12078	5969	44065
Extra Cost (Savings) / call	$0	($12)	($12)	($32)	($32)	
Total Cost (Savings)	$0	($191,298)	($21,883)	($386,482)	($190,997)	($790,661)
Visit Walk-In Clinic	452	1318	152	252	171	2345
Extra Cost (Savings) / call	$12	$0	$0	($20)	($20)	
Total Cost (Savings)	$5,427	$0	$0	($5,032)	($3,411)	($3,016)
Visit Family Dr.	791	479	456	503	0	2230
Extra Cost (Savings) / call	$12	$0	$0	($20)	($20)	
Total Cost (Savings)	$9,498	$0	$0	($10,065)	$0	($567)
Call Family Dr.	1018	2997	1216	3271	1535	10036
Extra Cost (Savings) / call	$24	$10	$10	($10)	($10)	
Total Cost (Savings)	$24,422	$29,965	$12,157	($32,710)	($15,348)	$18,487
Call hospital	1696	2877	304	2139	1876	8891
Extra Cost (Savings) / call	$0	$10	$10	($16)	($16)	
Total Cost (Savings)	$0	$28,767	$3,039	($34,220)	($30,014)	($32,428)
Ask family or friends	113	599	304	252	0	1268
Extra Cost (Savings) / call	$32	$20	$20	$0	$0	
Total Cost (Savings)	$3,618	$11,986	$6,079	$0	$0	$21,683
Call Pharmacy	0	120	0	126	171	416
Extra Cost (Savings) / call	$32	$20	$20	$0	$0	
Total Cost (Savings)	$0	$2,397	$0	$0	$0	$2,397
Watchful Waiting	1131	1318	0	377	171	2997
Extra Cost (Savings) / call	$32	$20	$20	$0	$0	
Total Cost (Savings)	$36,181	$26,369	$0	$0	$0	$62,551
Other	113	240	0	0	341	694
Extra Cost (Savings) / call	$32	$20	$20	$0	$0	
Total Cost (Savings)	$3,618	$4,794	$0	$0	$0	$8,413
TOTAL	13568	25890	4255	18997	10232	72942
TOTAL Cost (Savings)	$82,765	($87,019)	($608)	($468,509)	($239,770)	($713,141)

Table 7

Incremental Cost of TeleCare Service

(from the broad perspective of society at large)

Dollars and Cents...
Direct Cost / (Revenues)

		Total (2 Years)
1) TeleCare Direct Operating Expenses	=	**$1,330,769**
2) Potential Cost Savings from Appropriate Referrals to Less Costly Care		
a) "Best case" scenario (Tables 5 & 6): all callers fully comply with disposition		**($713,141)**
	Sub-total =	**$617,628**
b) "Worst case" scenario: observed trend in non-urgent ED (+9000 NUED @ C$32)		**$288,000**
	Sub-total =	**$1,618,769**

Production Losses...
Indirect Cost / (Benefits)

3) Benefit: Gains in Production (less time spent enroute & waiting)			
Minutes spent enroute to ED / Clinic (e.g 2 way trip)		40	
Minutes spent waiting (e.g. typical NUED Moncton Hosp.)		50	
Total minutes spent enroute & waiting per trip to ED / Clinic		90	
(Equivalent in hours)		1.50	
Average employment Income - Region 1 ('91 census, CPI inflated to '96)		$36,254	
i) Equivalent Earnings / hour (i.e. wage)		$18.13	
ii) Percent of TeleCare callers employed (survey '95)		54.8%	
Opportunity cost of one hour waiting time = i) X ii) X 50%		$4.97	
	Home Care	Other (Info Only etc)	
Call volume ('95 & '96)	18,997	8,957	
% calls otherwise resulting in ED or Clinic/ GP visit	78.8%	78.3%	
Number of Trips to ED / clinic avoided	14,970	7,013	
Value of Lost Travel Time avoided via "Home Care" over phone = (Hours / trip X Cost of Time X Number of Trips Avoided)		**($111,528) Benefit**	
Value of Lost Travel Time avoided via "Info Only" provided by phone = (Hours / trip X Cost of Time X Number of Trips Avoided)		**($52,251) Benefit**	
4) Benefit: Travel cost savings (re: Home care & Other/ Info Only) (20 km two way trip X $0.37/ km X Number of Trips Avoided)		**($162,674) Benefit**	
		=	**($326,453)**
5) Total Net Direct & Indirect Costs by Scenario:			
a) "Best case" : all callers fully comply with disposition		Sub-total =	**$291,175**
b) "Worst case": observed trend in non-urgent ED (+9000 NUED)		Sub-total =	**$1,292,316**

In Conclusion...

6) Cost-Effectiveness	**Number of Triage calls**	**Cost/call**
a) "Best case" : all callers fully comply with disposition	63,864	**$4.56**
b) "Worst case": observed trend in non-urgent ED (+9000 NUED)	63,864	**$20.24**

Figures

M121

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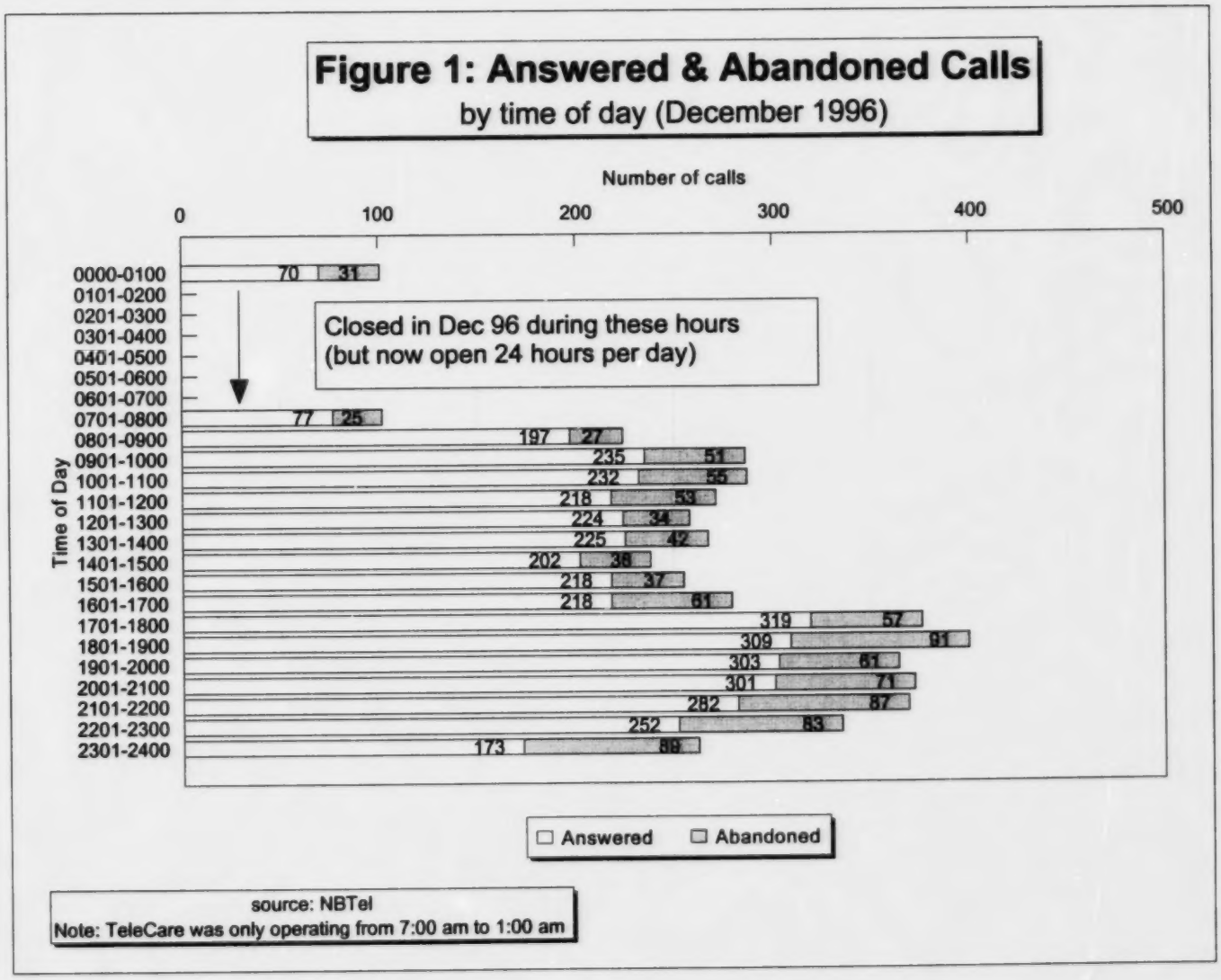
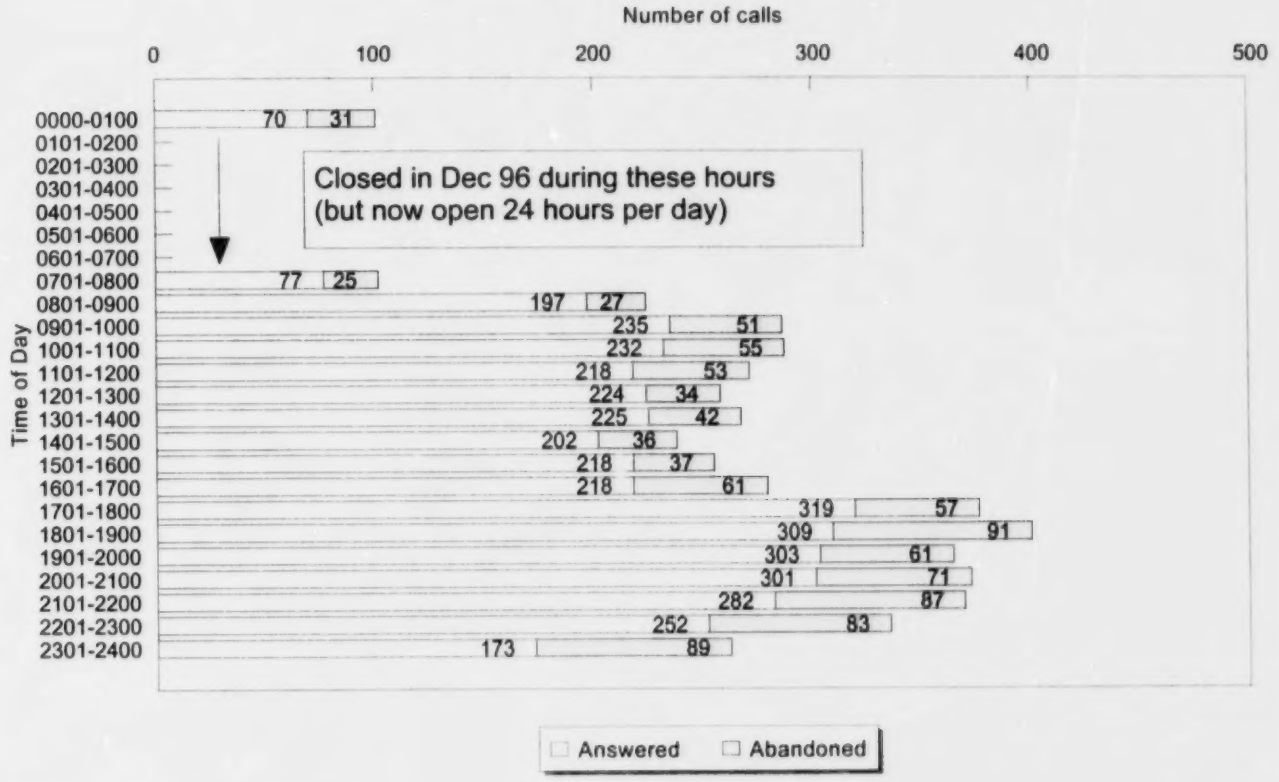


Figure 1: Answered & Abandoned Calls
by time of day (December 1996)
Number of calls
0
100
200
300
400
500
Time of Day
0000-0100
0101-0200
0201-0300
0301-0400
0401-0500
0501-0600
0601-0700
0701-0800
0801-0900
0901-1000
1001-1100
1101-1200
1201-1300
1301-1400
1401-1500
1501-1600
1601-1700
1701-1800
1801-1900
1901-2000
2001-2100
2101-2200
2201-2300
2301-2400
70
31
77
25
197
27
235
51
232
55
218
53
224
34
225
42
202
38
218
37
218
61
319
57
309
91
303
61
301
71
282
87
252
83
173
88
Closed in Dec 96 during these hours
(but now open 24 hours per day)
Answered
Abandoned
source: NBTel
Note: TeleCare was only operating from 7:00 am to 1:00 am

Figure 1: Answered & Abandoned Calls

by time of day (December 1996)



source: NBTel

Note: TeleCare was only operating from 7:00 am to 1:00 am

Figure 2: TeleCare Dispositions - Jan 1995 to Dec 1996

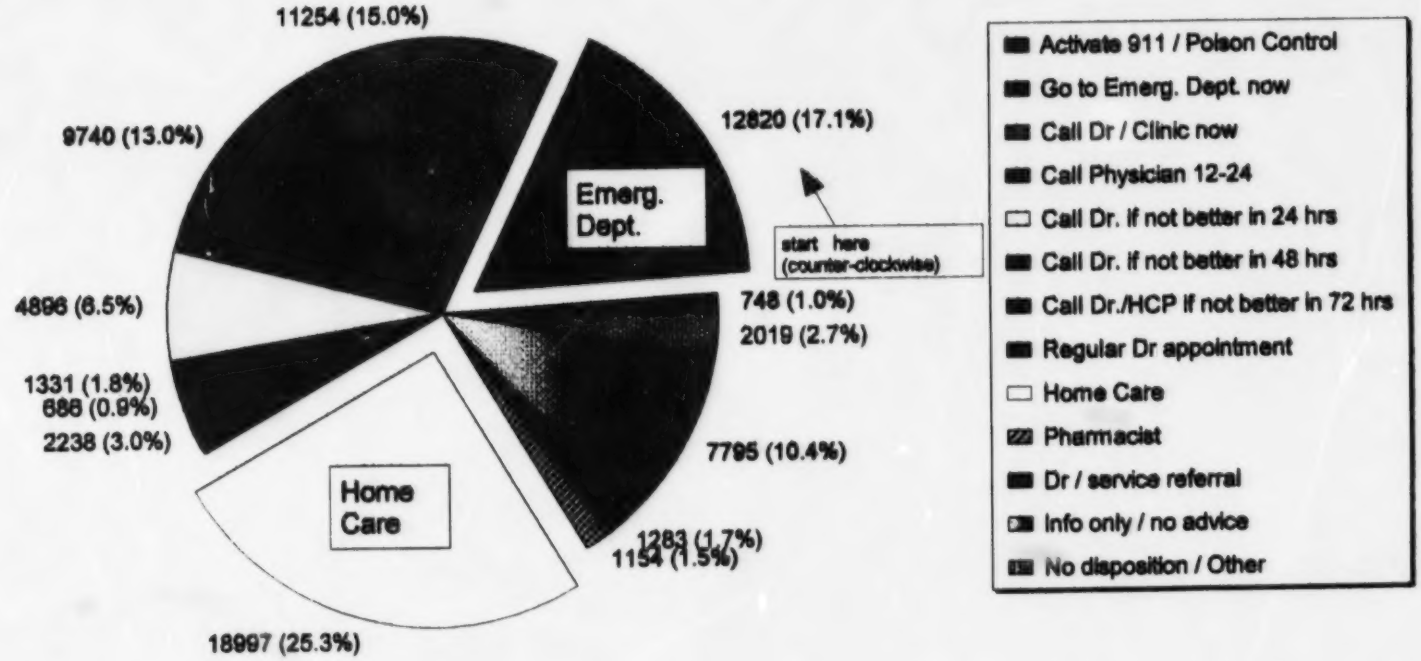


Figure 3

Age Distribution: TeleCare Callers

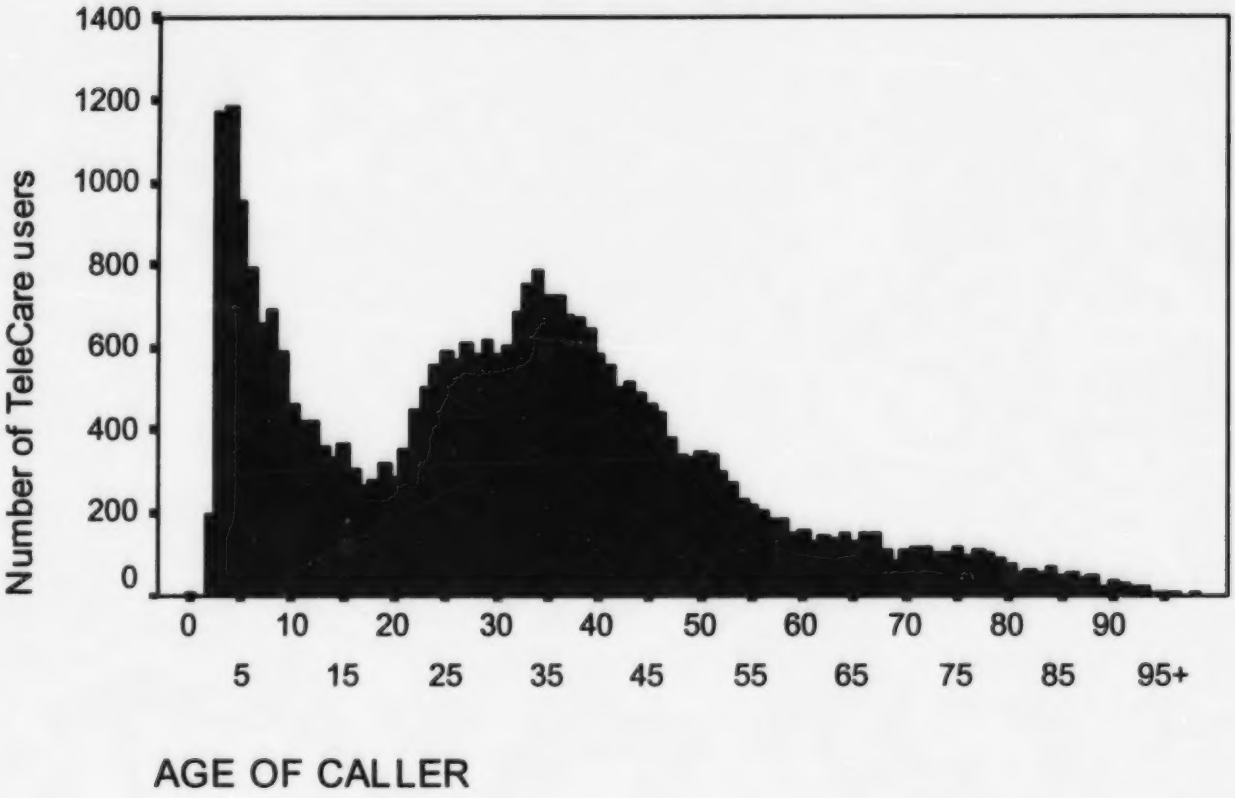
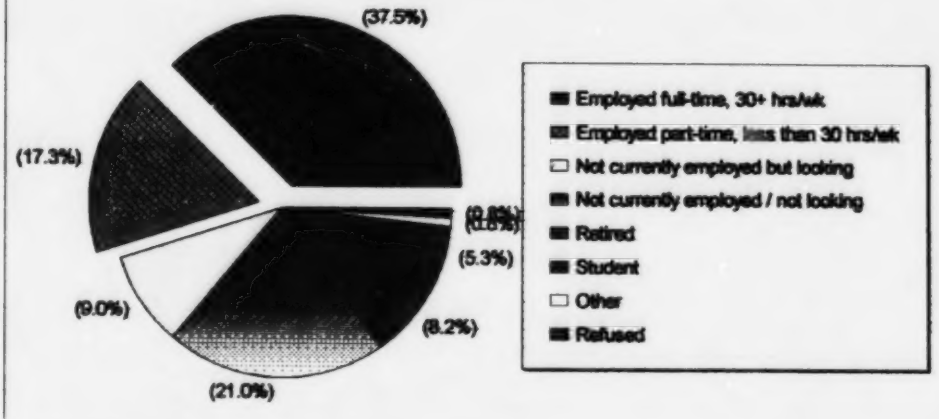


Figure 4: Which best describes your employment status? (TeleCare Callers)



source: CRA survey July 1995 (N=600 cases)

Employment Status: 1991 census (All Region 1 Residents)

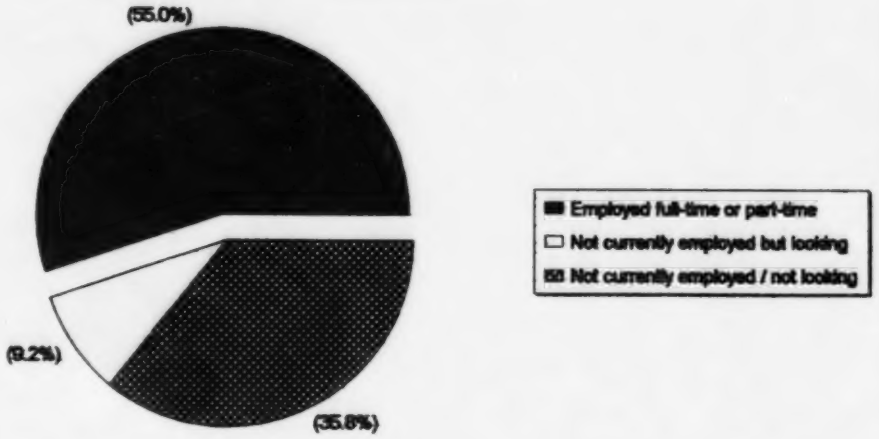
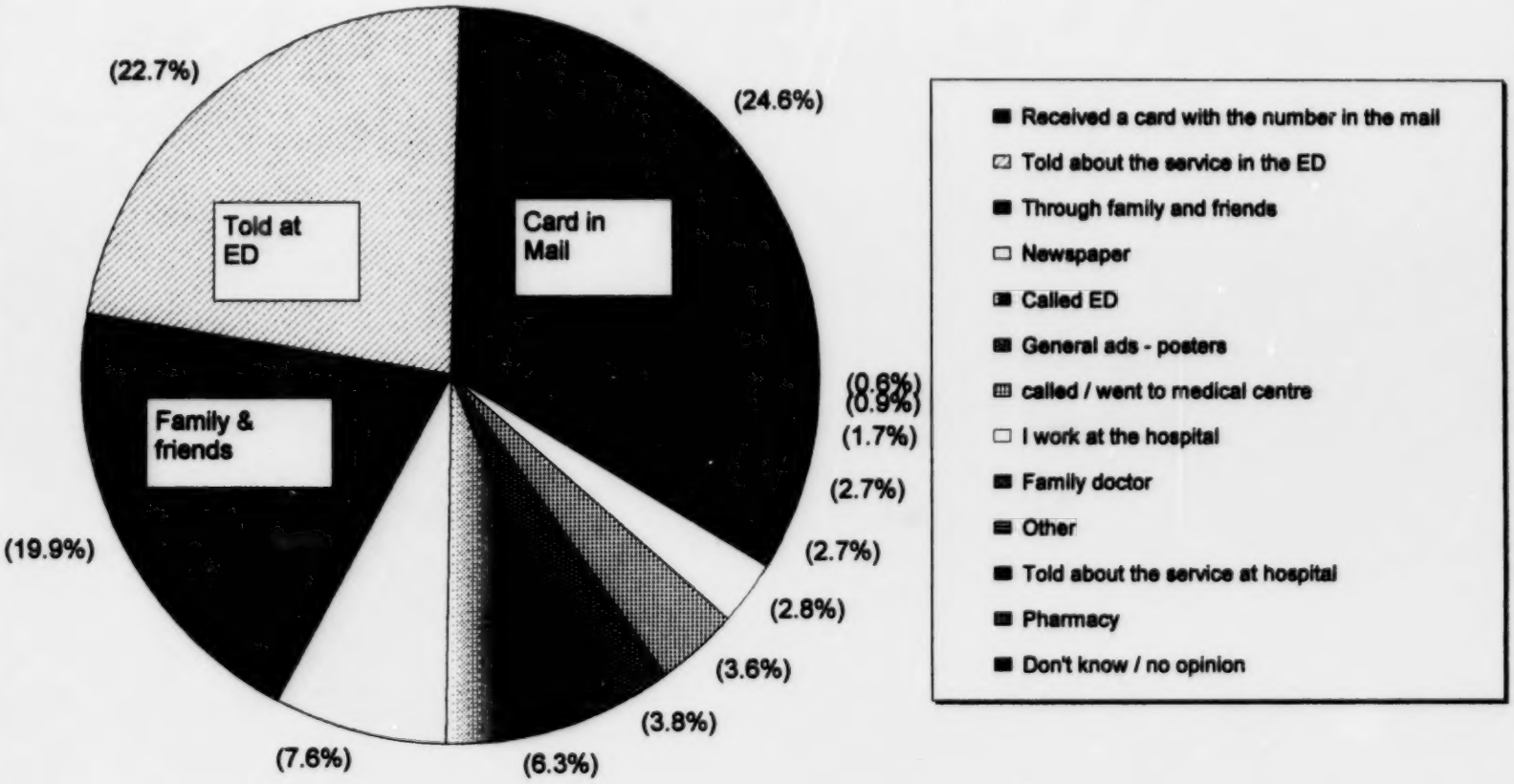
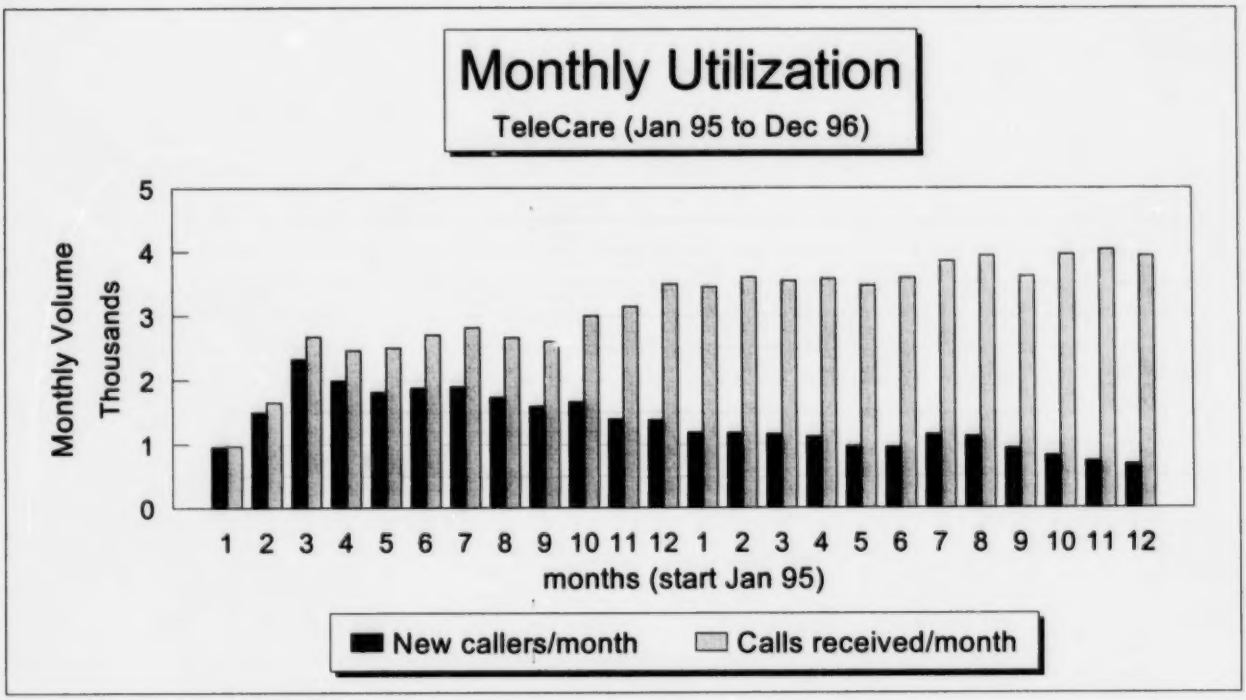


Figure 5: How did you find out about the TeleCare Service?



source: CRA survey July 1995 (N=600 cases)

Figure 6


Monthly Utilization
TeleCare (Jan 95 to Dec 96)
Monthly Volume
Thousands
0
1
2
3
4
5
1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
months (start Jan 95)
New callers/month
Calls received/month

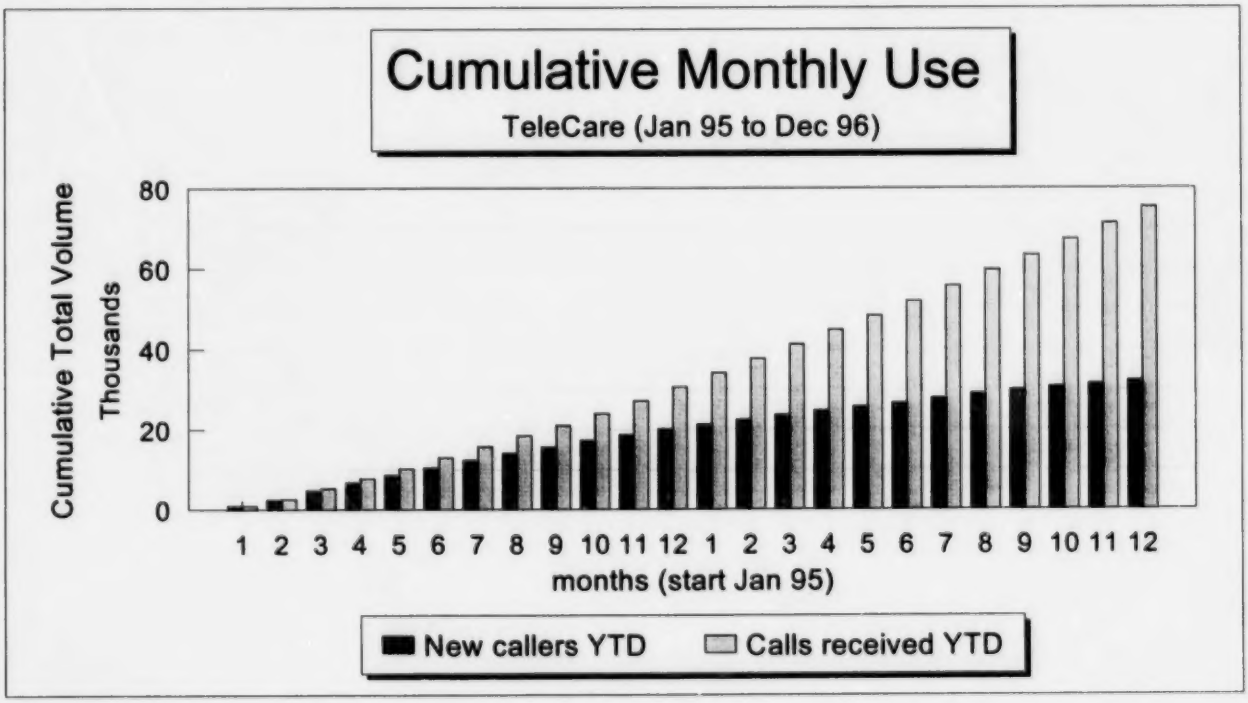
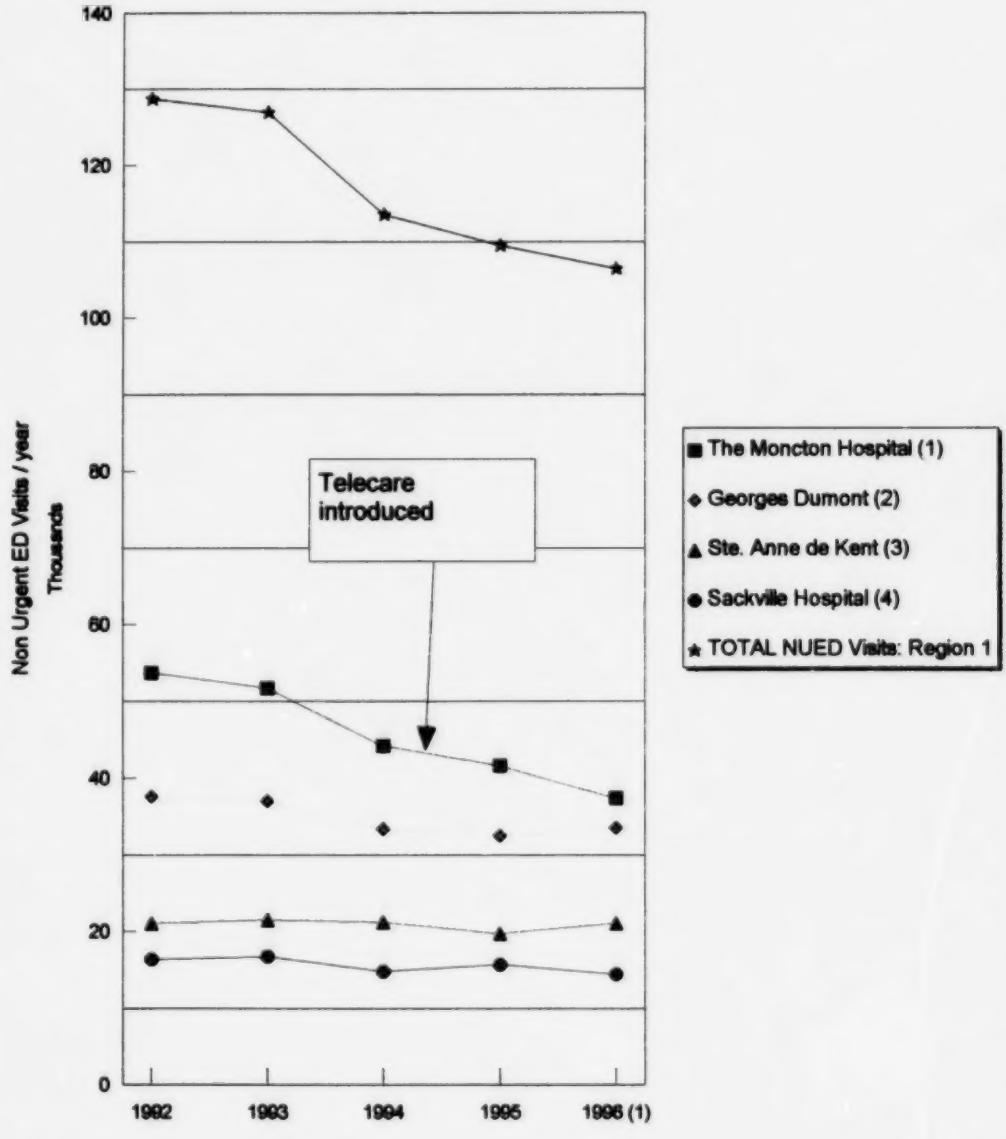

Cumulative Monthly Use
TeleCare (Jan 95 to Dec 96)
Cumulative Total Volume
Thousands
0
20
40
60
80
1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
months (start Jan 95)
New callers YTD
Calls received YTD

Figure 7: Non-Urgent ED Visits

Region 1



Note: (1) = TMH Non-Urgent for Aug - Dec 1996 is based on MediTech data; prior based on other info system, also by acuity;

(2) = GD Non-Urgent for 1992,94,95,96 from ED stats, for '93 from HS1s and 74% Non-Urgent interpolated from '92 & '94

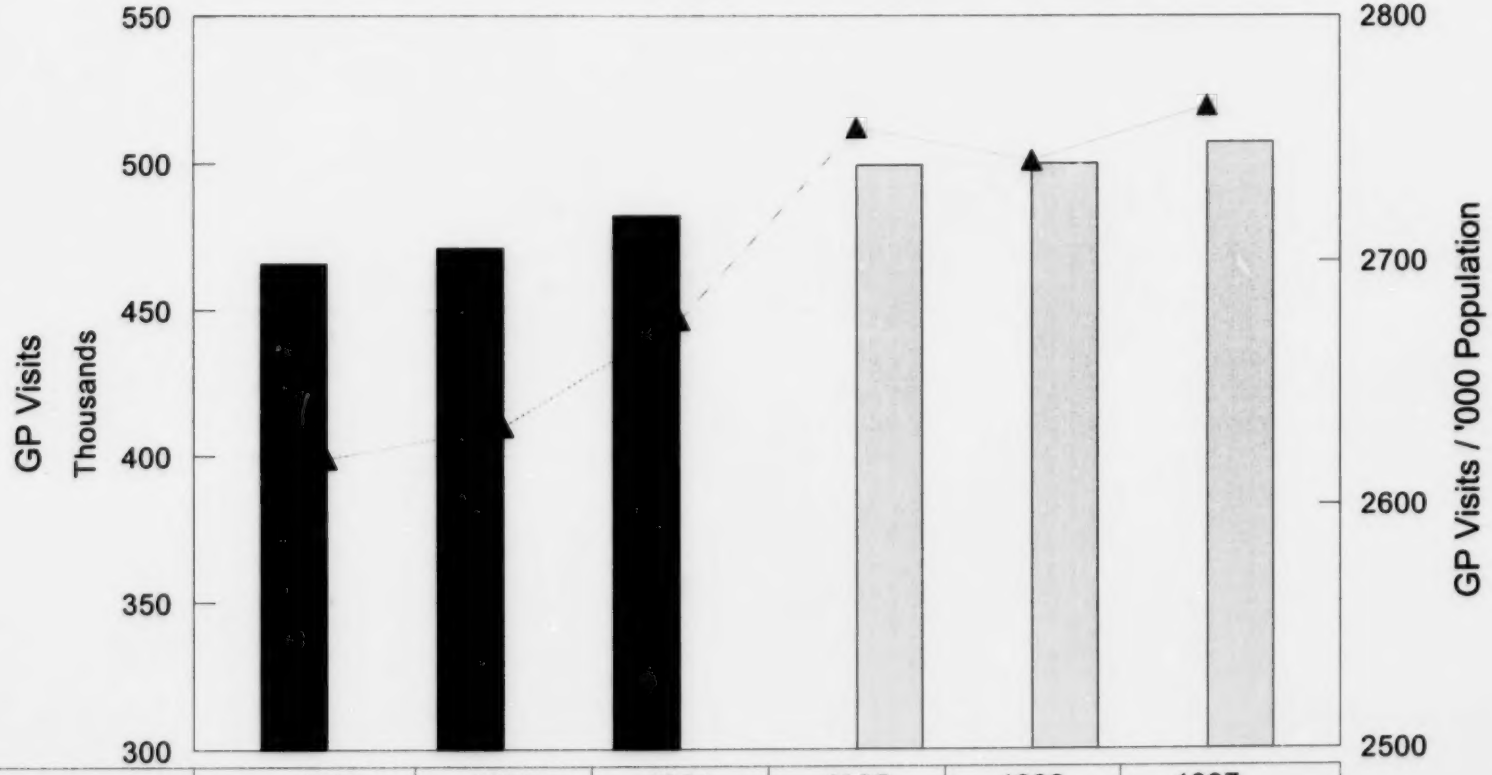
(3) = Ste. Anne de Kent NU for 1992 & 1993 based on HS1s from StatsCan with 74% Non-Urgent from prevailing '94 NU rate;

(4) = Sackville NU based on 84% of total ED visits observed in Non-Urgent survey Dec 8/94 to Jan 13/95, applied to total ED

Note: rates have not been age-standardized due to lack of detailed data

Figure 8: GP Office Visits - Region 1

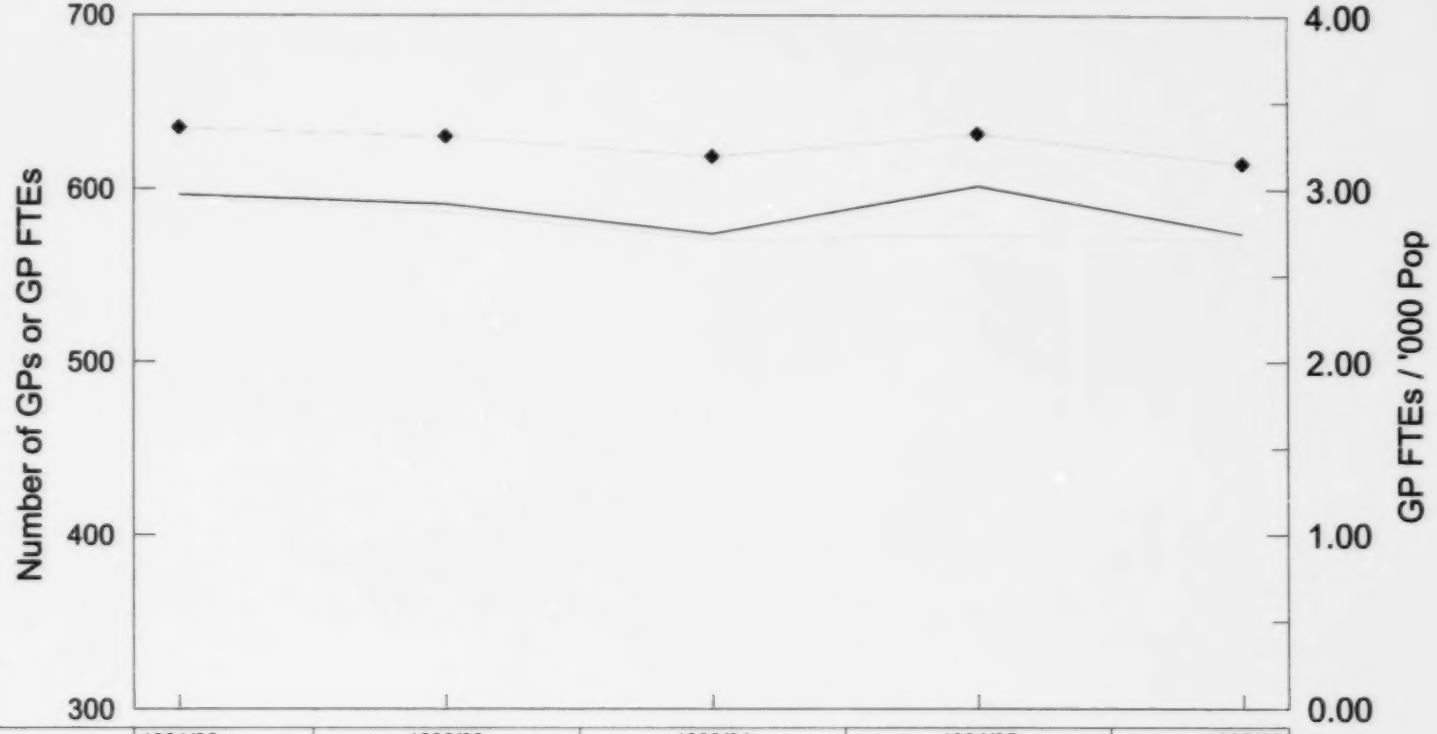
by calendar year



	1992	1993	1994	1995	1996	1997
■ Pre-TeleCare	465882	471114	482189			
□ Post-TeleCare				499,398	499,997	507,127
▲ Per Capita	2,619	2,632	2,676	2,755	2,741	2,764

Note: GP visits by Region 1 residents only

Figure 9: GP Resources - Region 1

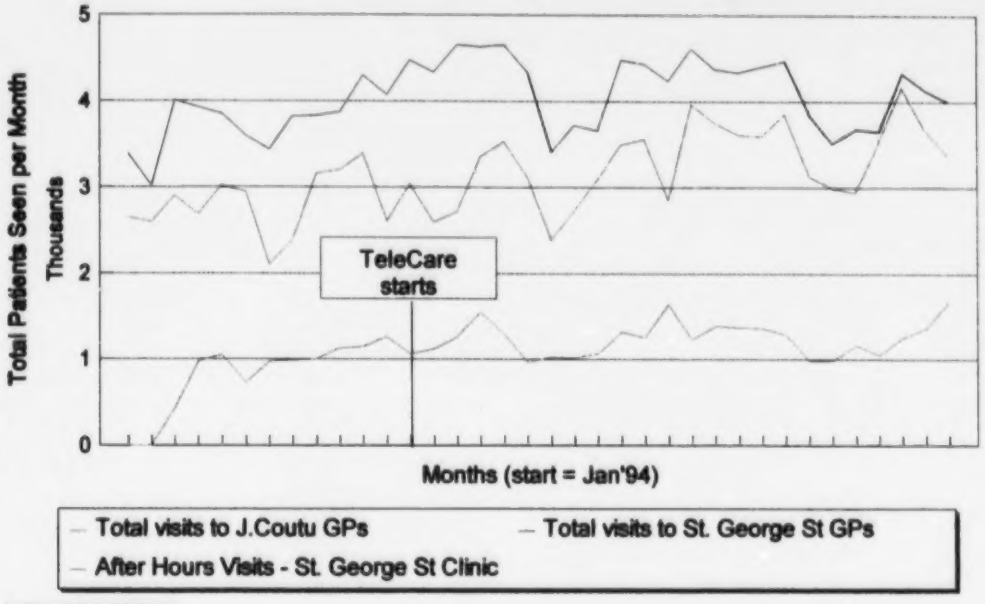


	1991/92	1992/93	1993/94	1994/95	1995/96
Number of GPs	595	587	571	574	571
- Full-Time-Equivalents	596.7	591.3	574.3	602.0	574.4
◆ FTEs / '000 Pop	3.35	3.30	3.19	3.32	3.15

source: Medicare

Figure 10: Office Visits for After Hours Clinic Physicians

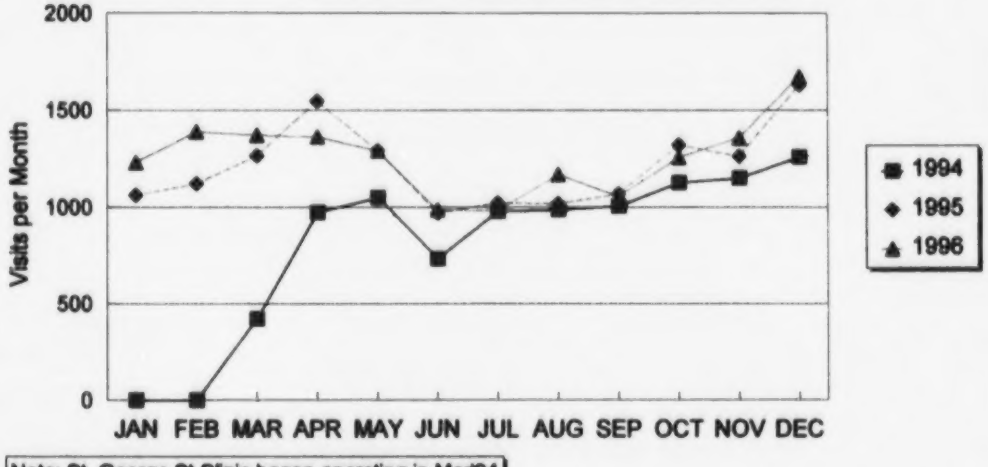
Patient Trends (Jan'94 to Dec'96)



source: Medicare

Figure 11: St. George St. - After Hours Clinic

Visits (Jan 1994 to Dec 1996)



Note: St. George St Clinic began operating in Mar'94

Appendix A

Cost-Effectiveness from Society's Broad Perspective

As an extension to the narrow payor perspective described in section 5.6, this Appendix considers additional costs and benefits from the perspective of the private citizen, and society at large. In particular, it addresses production losses in the form of waiting time, or other out-of-pocket costs incurred by individuals.

Indirect Costs / (Benefits)

As an offset against the Direct Cost of operating TeleCare, there are certain savings or indirect benefits which result from providing more timely and effective service by phone. As shown in **Table 7,** these indirect benefits stem from the value of time and money saved by preventing unnecessary trips to Walk-In Clinics or Emergency Departments, particularly by rural residents. In economic analysis, this value is commonly referred to as additional "consumer surplus", and should be considered together with other Direct Costs in calculating total Net Incremental Cost of TeleCare.

Accordingly, the value of time foregone can be costed at $4.97 per hour based on average employment income in Region 1[47]. In one possible scenario, if we assume a typical time spent en route of 40 minutes for a two-way trip to ED/Clinic, plus an additional 50 minutes of waiting-time upon arrival[48], this 1.5 hours equates with a combined travel/waiting cost of about $7.50 per typical trip. Added to this is a basic mileage fee for travel costs, estimated at $0.37 per km for each 20 km two-way trip. This equates with about $7.40 per trip avoided, in terms of out-of-pocket costs. Considering the number of "Home Care" and "Information Only" dispositions recorded over the pilot, and the percent who would otherwise have visited an ED or GP/Walk-In Clinic[49], this gives an overall number of unnecessary trips prevented by TeleCare's phone service. Applying the opportunity cost of time per trip to the number of unnecessary trips yields about **$326,000** in reduced travel cost and time savings (i.e. production gains, through less time off-work) as an Indirect Benefit.

Therefore, the cost-effectiveness ratios established in section 5.6 can be modified to reflect these additional indirect benefits (i.e. waiting time and mileage costs avoided):

"Best case scenario" (from society's perspective):
$291,175 net incremental cost divided by about **64,000** triage calls = **$4.56 per triage call**

"Worst case scenario" (from society's perspective):
$1,292,316 net incremental cost divided by **64,000** triage calls = **$20.24 per triage call**

---

47 Based on 1991 census data for employment income in Region 1. This hourly time cost assumes that time savings apply only for the employed portion of the TeleCare clientele (54%), and that only half of the trips will involve actual production losses at work. This provides a conservative estimate of the available Indirect Benefit.

48 Based on the median waiting time to see a physician at the Moncton City Hospital for Non-Urgent patients. (Note: waiting time has not changed significantly during the course of the pilot project).

49 Estimated from satisfaction survey conducted in March 1996, with cases matched by TeleCare disposition.

In the "best case" scenario, the marginal cost per non-urgent contact with TeleCare is less than either the marginal cost of a Walk-In Clinic visit ($20 per GP office visit), or a Non-Urgent Emergency Department visit ($32 per visit). In the "worst case" scenario, it is still less costly than NUED, but about the same cost as a GP/Walk-In Clinic visit. It should be noted though, that TeleCare still has other additional intangible benefits which are not explicitly reflected in these cost-effectiveness ratios[50] (see section 5.65), and that the marginal cost of operating TeleCare is apt to decrease when the service expands (i.e. due to economies of scale). For these reasons, we conclude that a health care system which includes TeleCare triage is more cost-effective than the "status quo" alternative, which consists entirely of traditional primary care entities (e.g. GP office, Walk-In Clinic, Emergency Department) for providing service to those with deferrable non-urgent symptoms.

50 In addition to the values obtained through direct use, there is also the "option value" that non-users would be willing-to-pay in order to ensure that the service is available should the need arise. As one possible indication of this amount, K. Phillips et al (1997) estimated that San Franciso residents were willing-to-pay $2.11/month for telephone access to a Poison Control Center in their area (even if they never actually used it), compared to over $6/month for those local residents who had used the service before.

Appendix B

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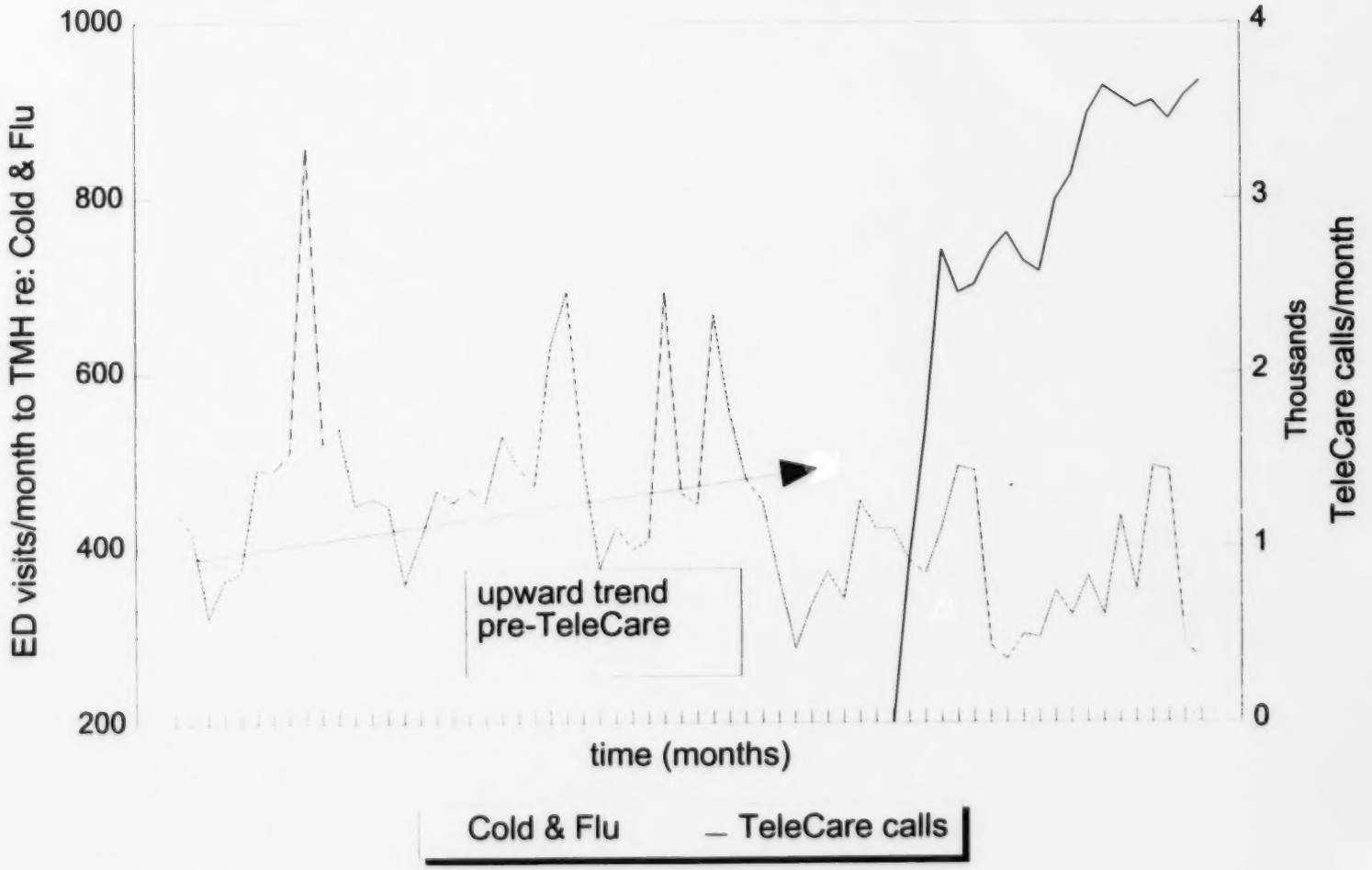
Appendix C

ED Trends in Cold & Flu Symptoms

The Moncton Hospital (Apr'91 to Jly'96)



(Example regression using COLD&FLU as dependent variable)

Summary results for various presenting symptoms most strongly associated with TeleCare call activity are provided on the table immediately following these regression results

**** MULTIPLE REGRESSION ****

Listwise Deletion of Missing Data

	Mean	Std Devi	Label
COLDFLU	431.984	114.237	
APR	.097	.298	
AUG	.081	.275	
DEC	.081	.275	
FEB	.065	.248	
JA	.081	.275	
JLY	.097	.298	
JUN	.097	.298	
MAY	.097	.298	
NOV	.081	.275	
OCT	.081	.275	
SEP	.081	.275	
CALLVOL	795.645	1366.169	
TREND	30.855	17.135	

N of Cases = 62

Equation Number 1 Dependent Variable.. COLDFLU

Multiple R	.76745
R Square	.58897
Adj R Square	.47765
Standard Error	82.56312

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	13	468852.88260	36065.60635
Residual	48	327200.10127	6816.66878

F = 5.29080 Signif F = .0000

---------- Variables in the Equation ----------

Variable	B	SE B	Beta	T	Sig T
APR	1.767633	53.522403	.004612	.033	.9738
AUG	-117.837116	55.396177	-.283164	-2.127	.0386
DEC	35.262083	55.443087	.084735	.636	.5278
FEB	-19.775867	58.430357	-.042876	-.338	.7365
JA	-5.077088	55.440946	-.012200	-.092	.9274
JLY	-140.808468	53.481959	-.367394	-2.633	.0114
JUN	-171.105512	53.449097	-.446444	-3.201	.0024
MAY	-66.773876	53.444887	-.174225	-1.249	.2176
NOV	-59.833298	55.430215	-.143780	-1.079	.2858
OCT	-4.413222	55.409104	-.010605	-.080	.9368
SEP	-100.972648	55.413114	-.242638	-1.822	.0747
CALLVOL	**-0.026943**	**0.011816**	**-.322219**	**-2.280**	**.0271**
TREND	-1.398566	0.930908	-.209776	-1.502	.1396
(Constant)	554.718636	47.087020		11.781	.0000

Residuals Statistics:

	Min	Max	Mean	Std Dev	N
*PRED	212.4341	577.3936	431.9839	87.6705	62
*RESID	-113.0877	281.6064	.0000	73.2389	62
*ZPRED	-2.5043	1.6586	.0000	1.0000	62
*ZRESID	-1.3697	3.4108	.0000	.8871	62

Total Cases = 62

Selected Conditions: TMH ED visits 1992-96

F = Fishers F stat (overall significance of equation)
Bcallvol = coefficient on Telecare call volume (i.e. its impact on that symptom)
t stat sig = alpha for significance of coefficient on call volume (i.e. accept if <5%)

Ranked in order of Telecare's impact on each type of visit

NEGATIVE ASSOCIATION		F	Bcallvol	t stat sig%
Colds & Flu (combined conditions)	Cold&Flu	5.3	-0.0269	2.7
abrasions contusions scratches	v24	19.0	-0.0260	0.0
post-op complication	v38	13.8	-0.0184	9.1
gastro-intestinal hemorrhage	v611	2.3	-0.0160	0.0
otitis media	v118	12.6	-0.0157	1.8
viral illness	v990	1.5	-0.0089	2.7
laceration -minor	v22	22.0	-0.0076	10.6
sore back -no injury	v214	8.0	-0.0072	0.2
chest wall pain	v520	6.5	-0.0051	0.3
UTI	v705	17.0	-0.0041	0.7
dental problems toothache	v114	5.5	-0.0038	0.1
fever NYD	v524	1.0	-0.0037	9.0
sore neck -no injury	v215	8.0	-0.0037	0.0
bronchitis	v511	11.0	-0.0036	9.0
strep throat	v550	2.6	-0.0023	2.8
unspec disorder of arm	v311	3.3	-0.0021	3.6
sinusitis	v8	7.1	-0.0019	9.5
pregnancy	v733	1.9	-0.0017	0.3
gout	v219	3.4	-0.0014	0.7
sore eye - no injury	v18	8.0	-0.0012	19.3
cyst /lesion	v13	6.7	-0.0010	8.0
laceration major	v23	2.6	-0.0008	13.7
cerumen impaction	v123	8.0	-0.0007	15.5
scabies / lice	v996	2.4	-0.0003	28.9
swollen glands	v31	2.1	-0.0002	29.8
POSITIVE ASSOCIATION:				
sprains - strains	v233	4.6	0.0181	11.9
unspecified chest conditions	v512	5.5	0.0079	6.5
unspecified abd. cond	v615	6.4	0.0068	16.4
gastro-enteritis	v604	4.4	0.0038	25.5
puncture / stab wound	v985	9.9	0.0025	14.8
epigastric pain	v603	1.7	0.0019	1.0
suture removal	v994	5.5	0.0019	2.8
ingrown nail	v915	6.2	0.0006	16.4

Appendix D

Regression Results

Objective:
To test whether or not TeleCare is associated with fewer NUED visits (i.e. Ho: $\beta 1 < 0$)

Data sources:
NUED data: The Moncton Hospital, Ste-Anne-de-Kent, Georges Dumont
TeleCare data: monthly call volumes (Region 1 callers)
Medicare data: monthly GP office visits (Region 1 residents)

Resulting estimated equation:

$$NUED = \beta 0 + \beta 1\ (Tcvol) + \beta 2\ (Offvisit) + \beta 3\ (Trend) + \beta 4\ (DTMH) + \beta 5\ (DStAK)$$

+3027	**+0.0856**	-0.008335	-25.74	+573.4	-1998.3
(476.5)	(0.02803)	(0.006788)	(3.669)	(90.49)	(200.22)

$$+ \beta 6\ (NUVISI_1) + \Sigma\ \beta i\ (Xi\ seasonality)$$

+0.33108 (0.07039)

i = 7 to 17
A priori significant group

$R^2_{adj} = 0.956$ F = 111.9 signif F = 0.0001

where:

$\beta 0$ = intercept; βi = coefficient on independent variable i
Tcvol = TeleCare monthly call volumes
Offvisit = monthly GP office visits (Region 1)
Trend = historical trend (i.e. NUED decreasing 26 visits per month, if all other factors constant)
DTMH = dummy variable identifying difference between baseline (G. Dumont) & The Moncton Hospital (i.e. on average, TMH has 573 more NUED per month than G. Dumont Hosp.)
DStAK = dummy variable identifying difference between baseline (G. Dumont) & Ste. Anne de Kent Hospital (i.e. on average, Ste. Anne de Kent has 1998 fewer NUED per month than G. Dumont Hospital)
NUVISI_1 = lagged value of NUED for each observed case (to correct for violations of BLUE assumptions required for OLS, that is, autocorrelation observed in a previous version)
Xi seasonality = 11 dummy variables required to identify seasonality by month.

Interpretation:
Overall, the equation explains about 96% of the observed variation in NUED visits, and is statistically significant overall (99% Confidence level). The positive coefficient on TeleCare call volume (Tcvol) is also significant itself, and can be interpreted to mean that for every additional call received, NUED visits increase by a fraction of a visit (0.0856). In other words, for every 11.7 calls received by TeleCare, NUED increases by one extra visit. Therefore, applying this coefficient to the combined total number of TeleCare calls observed during the 2 year pilot (N=75,248) indicates that about 6400 extra NUED visits were associated with TeleCare. Recognizing that a certain degree of statistical uncertainty still exists (i.e. standard error of $\beta 1$),

we may wish to refer to an interval estimate instead. In this case, the number of extra NUED visits associated with TeleCare would range from between 2000 and 10000 overall (95% confidence interval). This range estimate is consistent with the earlier estimate of 9000 extra NUED visits projected by extrapolating historical trends.

Appendix E

Satisfaction Survey

of Emergency Dept. Users

conducted in

Region 1, January 1995

Planning and Evaluation (PAE)

PATIENT SATISFACTION SURVEY (438-0001)

Good Afternoon/Evening, may I speak to (insert name of respondent) ? If available - continue, otherwise arrange call back. My name is _____ of Corporate Research Associates Inc.. As you may or may not know, we are currently conducting a Patient Satisfaction Survey on behalf of the Region 1 Hospital Corporation. According to their records you recently visited the Emergency Room at the (insert name of hospital facility) and I would like to ask you a few questions regarding the quality of services and care you received. It will take less than ten minutes, is this a good time?

• Yes	1	Continue
• No	2	Arrange CallBack If Possible or Thank & Terminate

1. Overall, would you say that you were ... with the quality of care and service you received on your most recent visit to the Emergency Department of (insert name of hospital)?

Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	No opinion (vol.)
1	2	3	4	5

2. In your opinion, would you say that the quality of care and service which you received was ...

• As Expected	1	Go To Question 4
• Better Than Expected, or	2	Go To Question 4
• Less Than Expected	3	Continue
• No opinion (vol.)	4	Go to Question 4

3. In what way was the care you received less than expected?

_____

_____

_____

4. Please indicate the extent of your satisfaction with each of the following elements of service you received from the nursing staff at the emergency department. Would you say that you were... with ...

	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	No opinion (vol.)
• The quality of nursing care you received	1	2	3	4	5
• The promptness with which you were assessed by a nurse	1	2	3	4	5
• The information you received about your illness, diagnostic procedures and treatment from the nurses	1	2	3	4	5
• The information or instructions you received about caring for yourself at home from the nurses	1	2	3	4	5
• The attention that was given by the nursing staff to your concerns and worries about your symptoms	1	2	3	4	5

• The courteousness of the nursing staff and their attempts to make your treatment as pleasant as possible	1	2	3	4	5

5. Now I would like you to indicate the extent of your satisfaction with each of the following elements of service you received from the physicians or doctors at the hospital. Would you say that you were ... with ...

	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	No opinion (vol.)
• The quality of physician care you received	1	2	3	4	5
• The promptness with which you were examined by a physician	1	2	3	4	5
• The information you received about your illness, diagnostic procedures and treatment from the physician	1	2	3	4	5
• The information or instructions you received about caring for yourself at home from the physician	1	2	3	4	5
• The attention that was given by the medical staff to your concerns and worries about your symptoms	1	2	3	4	5
• The courteousness of the medical staff and their attempts to make your treatment as pleasant as possible	1	2	3	4	5

6. How satisfied were you with the equipment and facilities at the Emergency Department of the hospital? Were you...

Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	No opinion (vol.)
1	2	3	4	5

7. Would you say that you were ... with the promptness with which your tests and procedures were completed?

Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	No opinion (vol.)
1	2	3	4	5

8. Thinking now only about the medical reason or condition which caused your most recent visit to the Emergency Department during the past 12 months, has it been necessary for you to visit the Emergency Department of this or any other hospital for this same medical reason or condition?

• Yes	1	Continue
• No	2	Go to Question 10

9. How may times have you visited the Emergency Department for this medical problem or condition during the past 12 months (Interviewer - record response as per week, per month, or per year)?

10. Which of the following, if any, best describes the reason for your most recent visit to the Emergency Department?

• Told to go by doctor	1
• Told to go by doctor's answering service, etc.	2
• Thought test might be required (blood test, x-rays, etc)	3
• More convenient than going to doctor's office	4
• Thought it would take too long to get an appointment with doctor	5
• Needed to see a doctor, but don't currently have a family doctor	6
• Other : _____	9

I now have just a few final questions about yourself that will help to classify the answers you have so kindly provided.

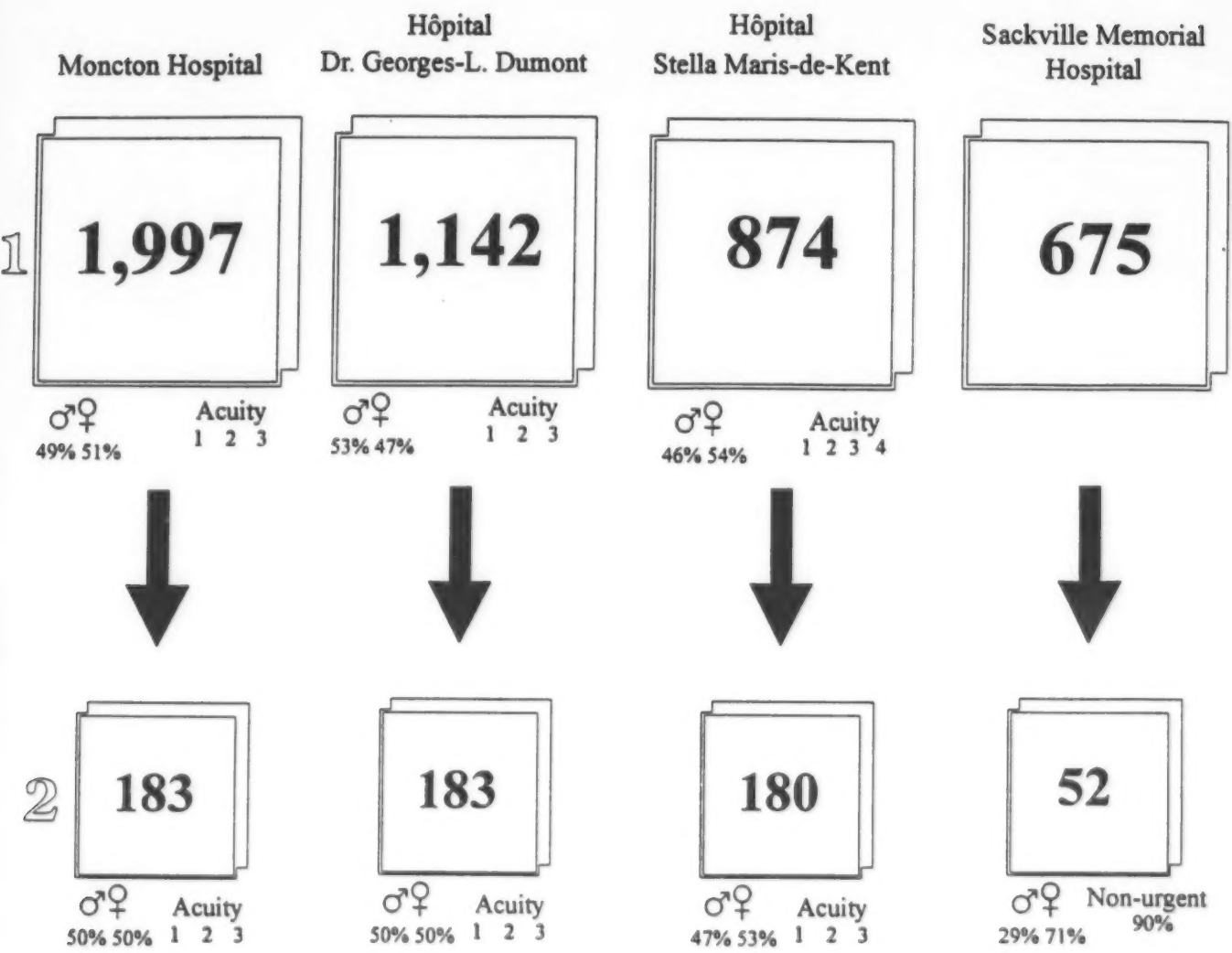
11. Which of the following best describes your current employment status, as you...

• Employed full-time, that is 30 hours or more a week	1
• Employed part-time, that is less than 30 hours per week	2
• Not currently employed but actively looking for work	3
• Not currently employed but not looking	4
• Retired	5
• Student	6
• Refused (vol.)	7
• Other: _____	9

12. What is the highest level of education you received?

• Less Than High School	1
• Graduated High School	2
• Some University/Community College/Tech.	3
• Graduated University/Community College/Technical	4
• Refused (vol.)	5
• Other: _____	6
• Postgraduate studies	

Satisfaction Survey - Patient Sample



1 Number of patients who registered at emergency departments between January 1st and 14th, 1995

2 Number of patients who participated in the satisfaction survey

Patient Satisfaction Survey Results

The following four tables describe the patient satisfaction survey results for the participants from each of the four facilities. The most popular three responses for each question are provided in raw number and percentage format. The remaining responses were varied depending on the question asked and available responses.

Moncton Hospital - Survey Results

Question:	1st	2nd	3rd
1) Quality of care/service received on most recent visit	Very satisfied 130 (71%)	Somewhat satisfied 32 (18%)	Somewhat dissatisfied 12 (7%)
2) Quality of care/service was...	As expected 99 (54%)	Better than expected 60 (33%)	Less than expected 22 (12%)
3) In what way was care/service less than expected?	Wait was too long 12 (44%)	Staff unfriendly 7 (26%)	Not diagnosed correctly 4 (15%)
4) Satisfaction re: nursing care			
- quality of care	Very satisfied 145 (80%)	Somewhat satisfied 26 (14%)	No opinion 7 (4%)
- promptness of assessment	Very satisfied 136 (74%)	Somewhat satisfied 23 (13%)	Somewhat dissatisfied 12 (7%)
- information about illness/procedures/treatment	Very satisfied 117 (64%)	No opinion 36 (20%)	Somewhat satisfied 25 (14%)
- instructions on self-care	Very satisfied 90 (49%)	No opinion 68 (37%)	Somewhat satisfied 20 (11%)
- attention to concerns/worries	Very satisfied 130 (71%)	Somewhat satisfied 25 (14%)	No opinion 20 (11%)
- courteousness	Very satisfied 148 (81%)	Somewhat satisfied 22 (12%)	No opinion 8 (4%)
5) Satisfaction re: physician care			
- quality of care	Very satisfied 141 (77%)	Somewhat satisfied 23 (13%)	Somewhat dissatisfied 8 (4%)
- promptness of assessment	Very satisfied 108 (59%)	Somewhat satisfied 41 (22%)	Very dissatisfied 13 (7%)
- information about illness/procedures/treatment	Very satisfied 124 (68%)	Somewhat satisfied 36 (20%)	No opinion 11 (6%)
- instructions on self-care	Very satisfied 120 (66%)	Somewhat satisfied 28 (15%)	No opinion 22 (12%)

- attention to concerns/worries	Very satisfied 137 (75%)	Somewhat satisfied 26 (14%)	No opinion 12 (7%)
- courteousness	Very satisfied 147 (80%)	Somewhat satisfied 22 (12%)	No opinion 7 (4%)
6) Satisfaction with equipment and facilities	Very satisfied 144 (79%)	Somewhat satisfied 21 (12%)	No opinion 12 (7%)
7) Satisfaction with promptness of tests/procedures	Very satisfied 136 (75%)	Somewhat satisfied 20 (11%)	No tests 16 (9%)
8) Repeat visits to ED for same medical reason (within past 12 months)	No 130 (71%)	Yes 53 (29%)	
9) Number of times to ED for same medical reason (within past 12 months)	"2 times" 22 (42%)	"1 time" 13 (25%)	"3 times" 5 (10%)
10) Reason for most recent visit to ED	was an emergency 46 (25%)	told to go by Dr. 33 (18%)	might need tests 24 (13%)
11) Employment status	Employed Full time 90 (49%)	Not employed Not looking 22 (12%)	Retired 22 (12%)
12) Highest level of education	< High School 62 (34%)	Graduated fr. High School 54 (30%)	Graduated fr. Univ/CC/Tech 35 (19%)

Hôpital Dr. Georges-L. Dumont - Survey Results

Question:	1st	2nd	3rd
1) Quality of care/service received on most recent visit	Very satisfied 95 (52%)	Somewhat satisfied 64 (35%)	Somewhat dissatisfied 15 (8%)
2) Quality of care/service was...	As expected 118 (65%)	Better than expected 42 (23%)	Less than expected 22 (12%)
3) In what way was care/service less than expected?	Wait was too long 12 (50%)	Staff unfriendly 4 (17%)	Not diagnosed correctly 3 (12%)
4) Satisfaction re: nursing care			
- quality of care	Very satisfied 124 (68%)	Somewhat satisfied 48 (26%)	No opinion 7 (4%)
- promptness of assessment	Very satisfied 111 (61%)	Somewhat satisfied 52 (28%)	Somewhat dissatisfied 9 (5%)
- information about illness/procedures/treatment	Very satisfied 90 (49%)	Somewhat satisfied 59 (32%)	No opinion 23 (13%)
- instructions on self-care	Very satisfied 86 (47%)	No opinion 46 (25%)	Somewhat satisfied 43 (24%)
- attention to concerns/worries	Very satisfied 97 (53%)	Somewhat satisfied 68 (37%)	No opinion 17 (9%)
- courteousness	Very satisfied 116 (63%)	Somewhat satisfied 55 (30%)	No opinion 8 (4%)
5) Satisfaction re: physician care			
- quality of care	Very satisfied 110 (60%)	Somewhat satisfied 56 (31%)	Somewhat dissatisfied 8 (4%)
- promptness of assessment	Very satisfied 93 (51%)	Somewhat satisfied 45 (25%)	Somewhat dissatisfied 23 (13%)
- information about illness/procedures/treatment	Very satisfied 102 (56%)	Somewhat satisfied 56 (31%)	Somewhat dissatisfied 12 (7%)
- instructions on self-care	Very satisfied 104 (57%)	Somewhat satisfied 52 (28%)	Very dissatisfied /No opinion 10 (6%)
- attention to concerns/worries	Very satisfied 98 (54%)	Somewhat satisfied 67 (37%)	Somewhat dissatisfied 7 (4%)
- courteousness	Very satisfied 115 (63%)	Somewhat satisfied 54 (30%)	Very dissatisfied 6 (3%)
6) Satisfaction with equipment and facilities	Very satisfied 115 (63%)	Somewhat satisfied 55 (30%)	Very dissatisfied 5 (3%)
7) Satisfaction with promptness of tests/procedures	Very satisfied 96 (53%)	Somewhat satisfied 46 (25%)	No tests 19 (10%)

8) Repeat visits to ED for same medical reason (within past 12 months)	No 115 (63%)	Yes 68 (37%)	
9) Number of times to ED for same medical reason (within past 12 months)	"2 times" 23 (36%)	"1 time" 12 (19%)	"3 times" 11 (17%)
10) Reason for most recent visit to ED	too long for appt at Dr. 44 (23%)	it was an emergency 35 (18%)	might need tests 28 (15%)
11) Employment status	Employed Full time 85 (46%)	Employed Part time 32 (18%)	Student 18 (10%)
12) Highest level of education	< High School 52 (28%)	Graduated fr. Univ/CC/Tech 46 (25%)	Graduated fr. High School 44 (24%)

Hôpital Stella Maris-de-Kent - Survey Results

Question:	1st	2nd	3rd
1) Quality of care/service received on most recent visit	Very satisfied 115 (64%)	Somewhat satisfied 48 (27%)	Somewhat dissatisfied 12 (7%)
2) Quality of care/service was...	As expected 122 (68%)	Better than expected 41 (23%)	Less than expected 16 (9%)
3) In what way was care/service less than expected?	Wait was too long 6 (43%)	Staff unfriendly 5 (36%)	Not diagnosed correctly 2 (14%)
4) Satisfaction re: nursing care			
- quality of care	Very satisfied 113 (63%)	Somewhat satisfied 62 (34%)	No opinion 4 (2%)
- promptness of assessment	Very satisfied 115 (64%)	Somewhat satisfied 55 (31%)	Somewhat dissatisfied 4 (2%)
- information about illness/procedures/treatment	Very satisfied 111 (62%)	Somewhat satisfied 39 (22%)	No opinion 25 (14%)
- instructions on self-care	Very satisfied 92 (51%)	No opinion 51 (28%)	Somewhat satisfied 34 (19%)
- attention to concerns/worries	Very satisfied 102 (57%)	Somewhat satisfied 53 (29%)	No opinion 20 (11%)
- courteousness	Very satisfied 130 (72%)	Somewhat satisfied 39 (22%)	No opinion 5 (3%)
5) Satisfaction re: physician care			
- quality of care	Very satisfied 122 (68%)	Somewhat satisfied 41 (23%)	Somewhat dissatisfied 10 (6%)
- promptness of assessment	Very satisfied 111 (62%)	Somewhat satisfied 49 (27%)	Somewhat dissatisfied 12 (7%)
- information about illness/procedures/treatment	Very satisfied 118 (66%)	Somewhat satisfied 44 (24%)	Somewhat dissatisfied 8 (4%)
- instructions on self-care	Very satisfied 106 (59%)	Somewhat satisfied 55 (31%)	No opinion 14 (8%)
- attention to concerns/worries	Very satisfied 111 (62%)	Somewhat satisfied 52 (29%)	No opinion 11 (6%)
- courteousness	Very satisfied 119 (66%)	Somewhat satisfied 45 (25%)	Somewhat dissatisfied 8 (4%)
6) Satisfaction with equipment and facilities	Very satisfied 106 (59%)	Somewhat satisfied 48 (27%)	Somewhat dissatisfied 14 (8%)
7) Satisfaction with promptness of tests/procedures	Very satisfied 104 (58%)	Somewhat satisfied 41 (23%)	No tests 25 (14%)

8) Repeat visits to ED for same medical reason (within past 12 months)	No 113 (63%)	Yes 67 (37%)	
9) Number of times to ED for same medical reason (within past 12 months)	"3 times" 18 (28%)	"2 times" 17 (27%)	"1 time" 12 (19%)
10) Reason for most recent visit to ED	too long for appt at Dr. 39 (21%)	might need tests 36 (19%)	was an emergency 35 (19%)
11) Employment status	Employed Full time 55 (31%)	Not Employed Looking 44 (24%)	Employed Part time 35 (19%)
12) Highest level of education	< High School 85 (47%)	Graduated fr. High School 47 (26%)	Graduated fr. Univ/CC/Tech 22 (12%)

Sackville Memorial Hospital - Survey Results

Question:	1st	2nd	3rd
1) Quality of care/service received on most recent visit	Very satisfied 36 (69%)	Somewhat satisfied 12 (23%)	Somewhat dissatisfied 3 (6%)
2) Quality of care/service was...	As expected 42 (81%)	Better than expected 6 (12%)	Less than expected 4 (8%)
3) In what way was care/service less than expected?	Not correct diagnosis 2 (40%)	Staff unfriendly 1 (20%)	Wait was too long 1 (20%)
4) Satisfaction re: nursing care			
- quality of care	Very satisfied 41 (79%)	Somewhat satisfied 8 (15%)	No opinion 3 (6%)
- promptness of assessment	Very satisfied 29 (56%)	Somewhat satisfied 18 (35%)	Somewhat dissatisfied 3 (6%)
- information about illness/procedures/treatment	Very satisfied 30 (58%)	No opinion 15 (29%)	Somewhat satisfied 6 (12%)
- instructions on self-care	No opinion 25 (48%)	Very satisfied 18 (35%)	Somewhat satisfied 9 (17%)
- attention to concerns/worries	Very satisfied 33 (64%)	No opinion 10 (19%)	Somewhat satisfied 9 (17%)
- courteousness	Very satisfied 43 (83%)	Somewhat satisfied 7 (14%)	Somewhat dissatisfied 2 (4%)
5) Satisfaction re: physician care			
- quality of care	Very satisfied 42 (81%)	Somewhat satisfied 6 (12%)	Somewhat/very dissatisfied 2 (4%)
- promptness of assessment	Very satisfied 24 (46%)	Somewhat satisfied 17 (33%)	Somewhat dissatisfied 7 (14%)
- information about illness/procedures/treatment	Very satisfied 35 (67%)	Somewhat satisfied 10 (19%)	Somewhat/very dissatisfied 3 (6%)
- instructions on self-care	Very satisfied 34 (65%)	Somewhat satisfied 10 (19%)	No opinion 4 (8%)
- attention to concerns/worries	Very satisfied 36 (69%)	Somewhat satisfied 11 (21%)	No opinion 2 (4%)
- courteousness	Very satisfied 39 (75%)	Somewhat satisfied 10 (19%)	No opinion 2 (4%)
6) Satisfaction with equipment and facilities	Very satisfied 39 (75%)	Somewhat satisfied 10 (19%)	No opinion 2 (4%)
7) Satisfaction with promptness of tests/procedures	Very satisfied 29 (56%)	No tests 11 (21%)	Somewhat satisfied 9 (17%)

8) Repeat visits to ED for same medical reason (within past 12 months)	No 35 (67%)	Yes 17 (33%)	
9) Number of times to ED for same medical reason (within past 12 months)	"2 times" 7 (41%)	"3 times" 4 (24%)	"1 time" 1 (6%)
10) Reason for most recent visit to ED	too long for appt at Dr. 23 (43%)	told to go by Dr answ. serv. 10 (19%)	do not have family Dr. 5 (10%)
11) Employment status	Employed Full time 15 (29%)	Employed Part time 13 (25%)	Retired 8 (15%)
12) Highest level of education	Graduated fr. High School 20 (39%)	< High School 11 (21%)	Some Univ/CC/Tech 9 (17%)

Appendix F

Satisfaction Survey

of TeleCare Callers

conducted in

July 1995

Planning and Evaluation (PAE)

PATIENT SATISFACTION SURVEY (444-0002)

General Instructions:
- o Interviewer must read each set of instructions for each part of this questionnaire.
- o Interviewer must record all responses clearly and verbatim where required.
- o Interviewer must avoid paraphrasing or rewording responses.
- o Record the following information:

Respondent's Name: _____

Telephone #: _____

City/Town: _____

Gender: Male 1

Female 2

Postal Code: _____

Visit Date/Time: _____
Day/Month/Year/Time (am/pm)

Good Afternoon/Evening, may I speak to *(Insert name of respondent.* If available - continue; otherwise arrange call back.) My name is _____ of Corporate Research Associates Inc. We are currently conducting a Patient Satisfaction Survey of TeleCare on behalf of the Department of Health and Community Services. As TeleCare is a pilot project, it is necessary to evaluate the quality of service and identify any areas of concern that callers to the service may have. According to their records you recently called TeleCare and I would like to ask you a few questions regarding the quality of service you received? It will take less than ten minutes, is this a good time?

o Yes	1	Continue
o No	2	Arrange CallBack If Possible or Thank & Terminate

To begin,

1. Was your call to TeleCare for you or for another member of your household?

o Self	1
o Another adult	2
o Child	3
o Other _____	4

2. Overall, would you say that you were ...with the quality of service you received during your most recent call to TeleCare?

o Very satisfied	1	Go to Question 4
o Somewhat satisfied	2	Go to Question 4
o Somewhat dissatisfied	3	Continue
o Very dissatisfied	4	Continue
VOLUNTEERED		
o No opinion	5	Go to Question 4

3. In what way were you (answer from Question 2) with the overall quality of service?

_____

_____

_____

4. In your opinion, would you say that the quality of service which you received was ...

o As expected	1	Go To Question 6
o Better than expected, or	2	Go To Question 6
o Less than expected	3	Continue
VOLUNTEERED		
o No opinion	4	Go To Question 6

Corporate Research Associates Inc., 1995

5. In what way was the service you received less than expected?

_____

_____

_____

6. How satisfied were you with the promptness with which your call was answered by the TeleCare nurse? Would you say you were....

o Very satisfied	1	Go to Question 8
o Somewhat satisfied	2	Go to Question 8
o Somewhat dissatisfied	3	Continue
o Very dissatisfied	4	Continue
VOLUNTEERED		
o No opinion	5	Go to Question 8

7. Why were you (answer from question 6) with the promptness of the TeleCare call answer?

_____

_____

_____

8. During your most recent call to TeleCare, approximately how many minutes did you have to wait on the telephone line before talking to a TeleCare nurse?

o _____ minutes

9. Please indicate the extent of your satisfaction with the TeleCare nurse for each of the following elements of service. Would you say that you were ... with: (Rotate categories)

	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	No Opinion (Vol.)
a. The quality of service you received from the TeleCare nurse	1	2	3	4	5
b. The medical information you received about your situation from the TeleCare nurse	1	2	3	4	5
c. The instructions provided by the TeleCare nurse about what you should do	1	2	3	4	5
e. The attention that was given by the Telecare nurse to your concerns and worries about your symptoms	1	2	3	4	5
f. The courteousness of the TeleCare nurse and the attempt to make your experience as pleasant as possible	1	2	3	4	5

10. Were you able to follow the instructions given to you by the TeleCare nurse?

o Yes	1	Go to Question 12
o No	2	Continue
VOLUNTEERED		
o No opinion	3	Go to Question 12

11. Why were you unable to follow the instructions given to you by the TeleCare nurse?

_____

_____

_____

12. How many times have you called the TeleCare Service during the past 6 months? (Record response as per week, per month, or per year)

o _____ # of times per _____

13. How did you find out about the TeleCare Service? (Do Not Read Responses. Code All That Apply.)

o Received a card with the number in the mail 1
o Told about the service in the Emergency Department . . 2
o Through family and friends 3
o From the newspaper 4
o I have called TeleCare before 5
o From my family doctor 6
o Other (Specify _____) 7
VOLUNTEERED
o No opinion 9

14. What would you have done in this situation if the TeleCare Service were not available? (Do Not Read Responses)

o Visited the Emergency Department 1
o Called family doctor 2
o Called a family member or friend 3
o Other (Specify _____) 4
VOLUNTEERED
o No opinion 9

15. How many times have you visited an Emergency Department of a hospital during the past 12 months? (Record response as per week, per month, or per year.)

o _____ # of times per _____

I now have just a few final questions about yourself that will help to classify the answers you have so kindly provided.

16. Which of the following best describes your current employment status, are you...

o Employed full-time, that is 30 hours or more per week . 1
o Employed part-time, that is less than 30 hours per week 2
o Not currently employed but actively looking for work . . 3
o Not currently employed but not looking 4
o Retired 5
o Student 6
VOLUNTEERED
o Other (Specify _____) 7
o Refused 9

17. What is the highest level of education you received?

o Less than high school 1
o Graduated high school 2
o Some university/community college/technical school . . . 3
o Graduated university/community college/technical school 4
o Post graduate studies 5
VOLUNTEERED
o Other (Specify _____) 6
o Refused 9

THANK YOU FOR YOUR COOPERATION & ASSISTANCE.

Interviewer's Certification:
I hereby certify that this survey was completed in the manner in which it was intended and understand that a portion of the completed surveys will be verified by the Field Supervisor.

Interviewer's Signature: _____ **Date:** _____

AGEGRP age group

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1.00	102	17.0	17.1	17.1
	2.00	4	.7	.7	17.7
	3.00	29	4.8	4.8	22.6
	4.00	297	49.5	49.7	72.2
	5.00	134	22.3	22.4	94.6
	6.00	22	3.7	3.7	98.3
	7.00	10	1.7	1.7	100.0
	.	2	.3	Missing	
	Total	600	100.0	100.0	

Valid cases 598 Missing cases 2

- -

GENDER

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Male	1	92	15.3	15.3	15.3
Female	2	508	84.7	84.7	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q1 Who was call for?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Self	1	245	40.8	40.9	40.9
Another Adult	2	79	13.2	13.2	54.1
Child	3	243	40.5	40.6	94.7
Other	4	32	5.3	5.3	100.0
	.	1	.2	Missing	
	Total	600	100.0	100.0	

Valid cases 599 Missing cases 1

- -

Q2 Overall quality of service: TeleCare

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Very Satisfied	1	518	86.3	86.3	86.3
Somewhat Satisfied	2	74	12.3	12.3	98.7
Somewhat Dissatisfie	3	6	1.0	1.0	99.7
Very Dissatisfied	4	1	.2	.2	99.8
No Opinion	5	1	.2	.2	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q4 Rate quality of service

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
As Expected	1	288	48.0	48.0	48.0
Better Than Expected	2	277	46.2	46.2	94.2
Less Than Expected	3	20	3.3	3.3	97.5
No Opinion	4	15	2.5	2.5	100.0

Q6 How satisfied re: promptness of call ans

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Very Satisfied	1	437	72.8	72.8	72.8
Somewhat Satisfied	2	112	18.7	18.7	91.5
Somewhat Dissatisfie	3	35	5.8	5.8	97.3
Very Dissatisfied	4	14	2.3	2.3	99.7
No Opinion	5	2	.3	.3	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q8 Number minutes you waited on phone?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	295	49.2	49.2	49.2
	1	95	15.8	15.8	65.0
	2	61	10.2	10.2	75.2
	3	29	4.8	4.8	80.0
	4	18	3.0	3.0	83.0
	5	42	7.0	7.0	90.0
	7	3	.5	.5	90.5
	8	6	1.0	1.0	91.5
	10	12	2.0	2.0	93.5
	11	1	.2	.2	93.7
	12	1	.2	.2	93.8
	13	2	.3	.3	94.2
	15	13	2.2	2.2	96.3
	20	7	1.2	1.2	97.5
	25	3	.5	.5	98.0
	30	1	.2	.2	98.2
	40	1	.2	.2	98.3
	60	1	.2	.2	98.5
	98	9	1.5	1.5	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q9_A Quality of service: TeleCare nurse

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Very Satisfied	1	546	91.0	91.0	91.0
Somewhat Satisfied	2	51	8.5	8.5	99.5
Somewhat Dissatisfie	3	1	.2	.2	99.7
Very Dissatisfied	4	2	.3	.3	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q9_B Rate medical info received from TeleCare

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Very Satisfied	1	503	83.8	83.8	83.8
Somewhat Satisfied	2	78	13.0	13.0	96.8
Somewhat Dissatisfie	3	12	2.0	2.0	98.8
Very Dissatisfied	4	4	.7	.7	99.5
No Opinion	5	3	.5	.5	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

Q9_C Rate instructions, what you should do

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Very Satisfied	1	524	87.3	87.3	87.3
Somewhat Satisfied	2	67	11.2	11.2	98.5
Somewhat Dissatisfie	3	6	1.0	1.0	99.5
Very Dissatisfied	4	2	.3	.3	99.8
No Opinion	5	1	.2	.2	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q9_D Attention given to your concerns

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Very Satisfied	1	541	90.2	90.2	90.2
Somewhat Satisfied	2	51	8.5	8.5	98.7
Somewhat Dissatisfie	3	3	.5	.5	99.2
Very Dissatisfied	4	2	.3	.3	99.5
No Opinion	5	3	.5	.5	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q9_E Courtousy of TeleCare nurse

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Very Satisfied	1	566	94.3	94.3	94.3
Somewhat Satisfied	2	33	5.5	5.5	99.8
Very Dissatisfied	4	1	.2	.2	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q10 Were you able to follow instructions given?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1	593	98.8	98.8	98.8
No	2	6	1.0	1.0	99.8
No Opinion	3	1	.2	.2	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q11 Q11. Why were you unable to follow instr

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Was not given any	1	1	.2	16.7	16.7
Too hard to follow	2	1	.2	16.7	33.3
Not confident with info	3	2	.3	33.3	66.7
Other	99	2	.3	33.3	100.0
	.	594	99.0	Missing	
	Total	600	100.0	100.0	

Q12_A #calls to TeleCare in last 6 months

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	317	52.8	52.8	52.8
	2	138	23.0	23.0	75.8
	3	54	9.0	9.0	84.8
	4	35	5.8	5.8	90.7
	5	21	3.5	3.5	94.2
	6	16	2.7	2.7	96.8
	7	1	.2	.2	97.0
	8	3	.5	.5	97.5
	10	4	.7	.7	98.2
	12	4	.7	.7	98.8
	15	2	.3	.3	99.2
	20	1	.2	.2	99.3
	98	4	.7	.7	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q13_1 How did you find out about TeleCare?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Got card in mail	1	156	26.0	26.0	26.0
Told at Emerg. Dept.	2	143	23.8	23.8	49.8
Family / friends	3	116	19.3	19.3	69.2
Newspaper	4	38	6.3	6.3	75.5
From Family Doctor	6	17	2.8	2.8	78.3
I work at hospital	7	17	2.8	2.8	81.2
Poster ads	8	18	3.0	3.0	84.2
Called Emerg. Dept.	9	39	6.5	6.5	90.7
Called Medical Centr	10	23	3.8	3.8	94.5
Pharmacy	11	5	.8	.8	95.3
Told at hospital	12	11	1.8	1.8	97.2
Don't know/ No Opini	98	4	.7	.7	97.8
Other	99	13	2.2	2.2	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

- -

Q14_1 Without TeleCare, likely action?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Visit Emerg. Dept	1	349	58.2	58.2	58.2
Call Family Dr.	2	77	12.8	12.8	71.0
Family or friend	3	10	1.7	1.7	72.7
Call Hospital	4	69	11.5	11.5	84.2
Call / go to Clinic	5	19	3.2	3.2	87.3
Call Pharmacy	6	3	.5	.5	87.8
Visit Dr	7	18	3.0	3.0	90.8
Watchful waiting	8	25	4.2	4.2	95.0
Don't know	98	25	4.2	4.2	99.2
Other	99	5	.8	.8	100.0
	Total	600	100.0	100.0	

Valid cases 600 Missing cases 0

Q15_A # visits to Emerg. Dept. in last 12 months

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	106	17.7	18.1	18.1
	1	108	18.0	18.5	36.6
	2	106	17.7	18.1	54.7
	3	56	9.3	9.6	64.3
	4	54	9.0	9.2	73.5
	5	39	6.5	6.7	80.2
	6	35	5.8	6.0	86.2
	7	15	2.5	2.6	88.7
	8	5	.8	.9	89.6
	9	2	.3	.3	89.9
	10	19	3.2	3.2	93.2
	12	13	2.2	2.2	95.4
	14	1	.2	.2	95.6
	15	3	.5	.5	96.1
	17	2	.3	.3	96.4
	20	10	1.7	1.7	98.1
	24	1	.2	.2	98.3
	25	2	.3	.3	98.6
	30	3	.5	.5	99.1
	35	1	.2	.2	99.3
	50	3	.5	.5	99.8
	75	1	.2	.2	100.0
	98	15	2.5	Missing	
	Total	600	100.0	100.0	

Valid cases 585 Missing cases 15

- -

Q16 Your current employment status?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Full time (30 hrs +)	1	225	37.5	37.8	37.8
Part time (<30 hrs)	2	104	17.3	17.5	55.3
Unemployed	3	54	9.0	9.1	64.4
Not looking (NLF)	4	126	21.0	21.2	85.5
Retired	5	49	8.2	8.2	93.8
Student	6	32	5.3	5.4	99.2
Other	7	5	.8	.8	100.0
	9	5	.8	Missing	
	Total	600	100.0	100.0	

Valid cases 595 Missing cases 5

- -

Q17 Your highest level of education?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Less than HighSchool	1	157	26.2	26.4	26.4
Grad High School	2	163	27.2	27.4	53.9
Some Univ/Coll/Tech	3	90	15.0	15.2	69.0
Grad Univ/Coll/Tech	4	170	28.3	28.6	97.6
Post Grad Studies	5	13	2.2	2.2	99.8
Other	6	1	.2	.2	100.0
Not stated	9	6	1.0	Missing	
	Total	600	100.0	100.0	

Valid cases 594 Missing cases 6

Appendix G

TeleCare / TéléSoins

Call-Back Satisfaction Survey

prepared for

Joint Project Management Committee

by

Chris Robinson

Planning & Evaluation (PAE)

May 22, 1996

CLIENT SATISFACTION SURVEY

General Instructions:
- Interviewer must read each set of instructions for each part of this questionnaire.
- Interviewer must record all responses clearly and verbatim where required.
- Interviewer must avoid paraphrasing or rewording responses.
- Record the following information:

Respondent's Name: _____ _____

Telephone #: _____ _____ Medicare #: _____ _____

Town/Village: _____ _____

Postal Code: _____ Doc. time for call-back: _____ min.

Date/Time of Call to Tele-Care: _____

Good afternoon/evening, may I speak to (*Insert name of respondent. If available - continue: otherwise arrange call back.*) My name is _____ of the Tele-Care Service. We are currently conducting a Patient Satisfaction Survey to evaluate the quality of service and identify any areas of concern that callers to the service may have. According to our records you recently called Tele-Care and I would like to ask you a few questions regarding the quality of service you received. It will take less than 5 minutes, is this a good time?

- Yes	1	Continue
- No	2	Arrange Callback if possible or Thank and terminate

To begin,

1. Would you consider your call to Tele-Care to be

   - urgent 1
   - moderately urgent..... 2
   - slightly urgent..... 3
   - non-urgent..... 4

2. Overall, would you say that you were... with the quality of service you received during your most recent call to Tele-Care?

   - Very satisfied 1
   - Somewhat satisfied 2
   - Somewhat dissatisfied 3
   - Very dissatisfied 4

   Volunteered
   - No opinion 5

3. On the day of your call, a Tele-Care worker took your name and phone number and the nurse afterwards returned your call. In your opinion, did you wait too long for the callback?

- Yes 1
- No 2

Volunteered

- No opinion 3

4. Approximately how much time would you say you waited for the callback?

Volunteered

- Less than 1 minute 1
- 2-3 minutes 2
- 4-5 minutes 3
- 6-10 minutes 4
- 11-15 minutes 5
- more than 16 minutes (Specify_____) 6

5. Which of the following would you prefer?

- Wait your turn on-line until a nurse is free to answer your call 1
- Have someone answer your call right away and waiting for a nurse to call you back..... 2

Volunteered

- No opinion 3

6. If you had to wait on line for a nurse, in your opinion, what would be a reasonable amount of time to wait?

- 0 seconds 1
- less than 30 seconds..... 2
- less than 1 minute..... 3
- less than 2 minutes..... 4
- less than 3 minutes..... 5
- less than 5 minutes..... 6
- less than 10 minutes..... 7

Volunteered

- No opinion..... 8

7. In your opinion, would you say that the quality of service which you received was...

- As expected ..... 1 Go to Question 9
- Better than expected, or ..... 2 Go to Question 9
- Less than expected ..... 3 Continue

Volunteered

- No opinion ..... 4 Go to Question 9

8. In what way was the service you received less than expected?

_____

_____

_____

9. Were you able to follow the instructions given to you by the Tele-Care nurse?

- Yes	1	Go to Question 11
- No	2	Continue
Volunteered		
No opinion	3	Go to Question 11

10. Why were you unable to follow the instructions given to you by the Tele-Care nurse?

_____

_____

_____

11. What would you have done in this situation if the Tele-Care Service would not have been available?
(Do not read the responses)

- Visited the Emergency Dept.	1
- Called the family doctor	2
- Called a family member or friend	3
- Other (Specify _____)	4
Volunteered	
- No opinion	5

12. How many times have you called Tele-Care during the past 12 months?

_____ times in last 12 months

THANK YOU FOR YOUR COOPERATION AND ASSISTANCE.

MIN Minutes until Call-back

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1.0	2	1.0	1.0	1.0
	2.0	19	9.3	9.8	10.8
	3.0	17	8.3	8.8	19.6
	4.0	18	8.8	9.3	28.9
	5.0	21	10.2	10.8	39.7
	6.0	9	4.4	4.6	44.3
	7.0	7	3.4	3.6	47.9
	8.0	9	4.4	4.6	52.6
	9.0	9	4.4	4.6	57.2
	10.0	6	2.9	3.1	60.3
	11.0	3	1.5	1.5	61.9
	12.0	9	4.4	4.6	66.5
	13.0	9	4.4	4.6	71.1
	14.0	5	2.4	2.6	73.7
	15.0	6	2.9	3.1	76.8
	16.0	5	2.4	2.6	79.4
	17.0	1	.5	.5	79.9
	18.0	3	1.5	1.5	81.4
	19.0	5	2.4	2.6	84.0
	20.0	5	2.4	2.6	86.6
	21.0	2	1.0	1.0	87.6
	22.0	4	2.0	2.1	89.7
	23.0	2	1.0	1.0	90.7
	24.0	3	1.5	1.5	92.3
	25.0	1	.5	.5	92.8
	26.0	3	1.5	1.5	94.3
	27.0	1	.5	.5	94.8
	29.0	2	1.0	1.0	95.9
	31.0	1	.5	.5	96.4
	33.0	1	.5	.5	96.9
	35.0	1	.5	.5	97.4
	38.0	1	.5	.5	97.9
	40.0	1	.5	.5	98.5
	49.0	1	.5	.5	99.0
	55.0	1	.5	.5	99.5
	120.0	1	.5	.5	100.0

$n = 258$ original
no response (53) → 20.5%
$\therefore n_{final} = 205$
completed

MIN Minutes until Call-back

99.0	11	5.4	Missing
Total	205	100.0	100.0

Valid cases 194 Missing cases 11

- -

Q1 Urgency of call (self-rated)

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
urgent	1.0	53	25.9	25.9	25.9
moderately urgent	2.0	84	41.0	41.0	66.8
	2.5	1	.5	.5	67.3
slightly urgent	3.0	35	17.1	17.1	84.4
non-urgent	4.0	32	15.6	15.6	100.0
	Total	205	100.0	100.0	

Valid cases 205 Missing cases 0

- -

Q2 Satisfaction re: quality of service

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Very satisfied	1.0	183	89.3	89.3	89.3
Somewhat satisfied	2.0	8	3.9	3.9	93.2
	2.5	1	.5	.5	93.7
Somewhat dissatisfie	3.0	10	4.9	4.9	98.5
Very dissatisfied	4.0	3	1.5	1.5	100.0
	Total	205	100.0	100.0	

Valid cases 205 Missing cases 0

Q3 Wait for CB too long?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Yes	1.0	12	5.9	5.9	5.9
No	2.0	172	83.9	84.3	90.2
No opinion	3.0	20	9.8	9.8	100.0
	99.0	1	.5	Missing	
	Total	205	100.0	100.0	

Valid cases 204 Missing cases 1

- -

Q4 Time waited for CB

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Did not wait..no CB	.0	12	5.9	6.1	6.1
Less than 1 minute	1.0	3	1.5	1.5	7.6
2-3 minutes	2.0	32	15.6	16.2	23.7
4-5 minutes	3.0	60	29.3	30.3	54.0
6-10 minutes	4.0	40	19.5	20.2	74.2
11-15 minutes	5.0	26	12.7	13.1	87.4
more than 16 minutes	6.0	16	7.8	8.1	95.5
	20.0	1	.5	.5	96.0
	60.0	7	3.4	3.5	99.5
	120.0	1	.5	.5	100.0
	99.0	7	3.4	Missing	
	Total	205	100.0	100.0	

Valid cases 198 Missing cases 7

Q5 Which would you prefer?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Wait turn on-line	1.0	23	11.2	11.2	11.2
Answer, call-back	2.0	172	83.9	83.9	95.1
No opinion	3.0	10	4.9	4.9	100.0
	Total	205	100.0	100.0	

Valid cases 205 Missing cases 0

- -

Q6 Reasonable time to wait on-line?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
0 seconds	1.0	5	2.4	2.4	2.4
less than 30 seconds	2.0	5	2.4	2.4	4.9
less than 1 minute	3.0	19	9.3	9.3	14.1
less than 2 minutes	4.0	40	19.5	19.5	33.7
less than 3 minutes	5.0	28	13.7	13.7	47.3
less than 5 minutes	6.0	72	35.1	35.1	82.4
less than 10 minutes	7.0	26	12.7	12.7	95.1
No opinion	8.0	7	3.4	3.4	98.5
As long as necessary	9.0	2	1.0	1.0	99.5
	20.0	1	.5	.5	100.0
	Total	205	100.0	100.0	

Valid cases 205 Missing cases 0

Q7 Quality service met expectations?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
As expected	1.0	103	50.2	50.2	50.2
Better than expected	2.0	90	43.9	43.9	94.1
Less than expected	3.0	12	5.9	5.9	100.0
	Total	205	100.0	100.0	

Valid cases 205 Missing cases 0

- - - -

Q11 What would you have done otherwise?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Visit Emerg Dept	1.0	117	57.1	57.1	57.1
Call my GP	2.0	27	13.2	13.2	70.2
Ask family / friend	3.0	5	2.4	2.4	72.7
	4.0	11	5.4	5.4	78.0
No opinion	5.0	5	2.4	2.4	80.5
Watchful waiting	6.0	1	.5	.5	81.0
Ask pharmacist	7.0	7	3.4	3.4	84.4
Call hosp / ED	8.0	25	12.2	12.2	96.6
Call clinic	9.0	7	3.4	3.4	100.0
	Total	205	100.0	100.0	

Valid cases 205 Missing cases 0

Q12 # calls to TeleCare in past 12 months?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1.0	80	39.0	39.0	39.0
	2.0	32	15.6	15.6	54.6
	3.0	32	15.6	15.6	70.2
	4.0	10	4.9	4.9	75.1
	5.0	11	5.4	5.4	80.5
	6.0	12	5.9	5.9	86.3
	7.0	8	3.9	3.9	90.2
	8.0	3	1.5	1.5	91.7
	10.0	7	3.4	3.4	95.1
	15.0	2	1.0	1.0	96.1
	20.0	2	1.0	1.0	97.1
	25.0	3	1.5	1.5	98.5
	30.0	2	1.0	1.0	99.5
	50.0	1	.5	.5	100.0
	Total	205	100.0	100.0	

Valid cases 205 Missing cases 0

Q2 Satisfaction re: quality of service by Q1 Urgency of call (self-rated)

Q2	Count / Col Pct	Q1 urgent 1.0	moderately urgen 2.0	2.5	slightly urgent 3.0	non-urgent 4.0	Row Total
1.0 Very satisfied		46 86.8	78 92.9	1 100.0	29 82.9	29 90.6	183 89.3
2.0 Somewhat satisfi		1 1.9	3 3.6		3 8.6	1 3.1	8 3.9
2.5						1 3.1	1 .5
3.0 Somewhat dissati		5 9.4	3 3.6		2 5.7		10 4.9
4.0 Very dissatisfie		1 1.9			1 2.9	1 3.1	3 1.5
Column Total		53 25.9	84 41.0	1 .5	35 17.1	32 15.6	205 100.0

Number of Missing Observations: 0

Q11 What would you have done otherwise? by Q1 Urgency of call (self-rated)

Page 1 of 1

Q11 / Count	Q1 urgent 1.0	moderately urgen 2.0	2.5	slightly urgent 3.0	non-urgent 4.0	Row Total
1.0 Visit Emerg Dept	44	44		13	16	117 57.1
2.0 Call my GP	3	11	1	6	6	27 13.2
3.0 Ask family / fri		3		2		5 2.4
4.0	3	4		3	1	11 5.4
5.0 No opinion	1	2		1	1	5 2.4
6.0 Watchful waiting		1				1 .5
7.0 Ask pharmacist	1	3		1	2	7 3.4
8.0 Call hosp / ED	1	10		8	6	25 12.2
9.0 Call clinic		6		1		7 3.4
Column Total	53 25.9	84 41.0	1 .5	35 17.1	32 15.6	205 100.0

Number of Missing Observations: 0

Appendix H

Is TeleCare associated with more or less office visits to the St. George St. Walk-In Clinic?

variables:
Y = NPatients = number of patients per month at St. George St. After-Hours Clinic (source: Dr. Ken Mitton)
TCcalls = monthly call volume to TeleCare
mo1 to mo11 = seasonal dummy variables
Trend = underlying trend over time

Regression Output: NPatients @ George St Clinic (Mitton) = TCcalls + seasonal dummies + trend

Constant		842.513
Std Err of Y Est		287.199
R Squared		0.68856
No. of Observations		29
Degrees of Freedom		15

	TCcalls	Trend	mo1	mo2	mo3	mo4	mo5	mo6	mo7	mo8	mo9	mo10	mo11
X Coefficient(s)	-0.121	49.340	-447.41	-428.03	-126.58	-41.71	-172.04	-347.06	-212.01	-264.16	-314.24	-156.85	-233.43
Std Err of Coef.	0.124	22.283	273.98	277.05	282.92	273.16	267.27	300.29	296.10	290.31	287.98	287.74	287.27
t stat	-0.97	2.21	-1.63	-1.54	-0.45	-0.15	-0.64	-1.16	-0.72	-0.91	-1.09	-0.55	-0.81

Conclude: the t stat on TCcalls is statistically insignificant (less than critical value 1.96) , so there is no apparent association

Appendix I

Is TeleCare associated with more or less office visits to physicians practising at Moncton Walk-In Clinics?

variables:
Y = OfficeVisits = number of office visits per month to GPs practising at Jean-Coutu & St. George St. After-Hours Clinics
TCcalls = monthly call volume to TeleCare
TCactive = dummy variable to show impact of TeleCare's existence (0 = pre-TeleCare, 1= post implementation)
mo1 to mo11 = seasonal dummy variables
Trend = underlying trend over time

A) Regression Output: OfficeVisits = TCcalls + seasonal dummies + trend

Constant		6025.99											
Std Err of Y Est		462.819											
R Squared		0.79631											
No. of Observations		36											
Degrees of Freedom		22											
	TCcalls	Trend	mo1	mo2	mo3	mo4	mo5	mo6	mo7	mo8	mo9	mo10	mo11
X Coefficient(s)	0.07	35.23	793.14	255.14	710.70	803.31	1031.90	193.88	-899.62	-460.54	64.22	891.20	823.24
Std Err of Coef.	0.18	28.70	407.15	412.79	423.00	407.13	396.40	393.10	391.04	384.01	378.76	379.17	378.18
t stat	0.38	1.23	1.95	0.62	1.68	1.97	2.60	0.49	-2.30	-1.20	0.17	2.35	2.18

B) Regression Output: OfficeVisits = TCactive + seasonal dummies + trend

Constant		6060.44											
Std Err of Y Est		451.871											
R Squared		0.80584											
No. of Observations		36											
Degrees of Freedom		22											
	TCactive	Trend	mo1	mo2	mo3	mo4	mo5	mo6	mo7	mo8	mo9	mo10	mo11
X Coefficient(s)	354.33	30.93	677.90	162.97	644.71	737.44	968.85	142.25	-938.35	-496.61	23.79	871.86	813.26
Std Err of Coef.	319.52	15.37	405.86	399.70	394.04	388.91	384.32	380.31	376.87	374.04	371.82	370.23	369.27
t stat	1.11	2.01	1.67	0.41	1.64	1.90	2.52	0.37	-2.49	-1.33	0.06	2.35	2.20

Conclude: the t stat on both TCcalls and TCactive are statistically insignificant (less than critical value 1.96) , so there is no apparent association

Appendix J

TeleCare Dispositions: see DR/clinic within 24 hours

		Dr. O'Hanley team				
		ED	DR 24hr	DR 25+hr	Home Care	Total
Dr. Touchburn team	ED	1 3.3%				1 3.3%
	DR 24hr		25 83.3%	1 3.3%		26 86.7%
	DR 25+hr					0 0.0%
	Home Care				3 10.0%	3 10.0%
		1 3.3%	25 83.3%	1 3.3%	3 10.0%	30

Inter-rater reliability: weighted kappa = 0.960 (alpha 5%; 19 times out of 20)

TeleCare Dispositions: go to Emergency Department immediately

		Dr. O'Hanley team				
		ED	DR 24hr	DR 25+hr	Home Care	Total
Dr. Touchburn team	ED	41 78.8%	3 5.8%			44 84.6%
	DR 24hr	4 7.7%	2 3.8%			6 11.5%
	DR 25+hr			2 3.8%		2 3.8%
	Home Care					0 0.0%
		45 86.5%	5 9.6%	2 3.8%	0 0.0%	52

Inter-rater reliability: weighted kappa = 0.703 (alpha 5%; 19 times out of 20)